



National Oceanographic Partnership Program

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Report to the U.S. Congress on the National Oceanographic Partnership Program

March 2003

National Ocean Research Leadership Council

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I. Executive Summary

Established in FY 1997, the National Oceanographic Partnership Program (NOPP) promotes the national goals of assuring national security, advancing economic development, protecting quality of life, and strengthening science education and communication through improved knowledge of the ocean. The National Ocean Research Leadership Council (NORLC), now comprising leaders of fifteen Federal agencies, guides NOPP in identifying and carrying out partnerships among Federal agencies, industry, and other members of the oceanographic scientific community in support of those goals.

NOPP investments have focused on the following five areas: operational/routine observations, research “observatories”, observational technique development, a “commons” for ocean information, and outreach/education. NOPP funded activities are those that are either solicited or managed by NOPP and involve support from two or more agencies. Overall investment in NOPP funded activities has increased significantly since the program’s inception, reaching a total of \$26 million in FY 2002. From FY 1997 to FY 2002, NOPP has funded 82 projects, including 20 renewal projects, in response to Broad Agency Announcements and Requests for Proposals. Of the total funds awarded during this period, approximately 62%, 18%, 11% and 9% went to academia, government, industry and non-governmental organizations/others, respectively.

In addition to NOPP funded activities, individual agencies invest in NOPP related activities, which are funded primarily by a single agency in response to plans produced by NOPP entities. Examples include a military ocean survey using academic research vessels and several projects related to the development of an Integrated Ocean and Observing System (IOOS), which is coordinated through a NOPP interagency office called Ocean.US. Significant new investments in NOPP related activities are anticipated over the next decade.

Highlights of the NOPP Program in FY 2002 and early part of FY 2003 include the funding of individual projects as well as progress on broader planning efforts. Eleven projects were funded in FY 2002. In recognition of the fundamental role of partnerships in NOPP activities, the 2002 NOPP Award for Excellence in Partnering went to the “Coastal Marine Demonstration of Forecast Information to Mariners for the U.S. East Coast Project” (CMDP), an integrated system of nowcast and forecast products of value to mariners. Over a two-year period CMDP forecast products were made available via the Internet to marine customers in the Chesapeake Bay and surrounding coastal areas. These products are now being produced operationally by NOAA.

In terms of broader planning efforts, the Federal Oceanographic Facilities Committee (FOFC) published the Fleet Renewal Plan, “Charting the Future for the National Academic Research Fleet,” which was provided to Congress in March 2002. FOFC is presently in the process of implementation planning. Ocean.US, an interagency office established by NOPP to promote the IOOS, convened a national workshop in March 2002 to provide guidance for the phased implementation of IOOS. An IOOS implementation plan will be presented to the NORLC for consideration in FY 2003. In addition to progress on implementation planning for both academic fleet renewal and IOOS, the Ocean Research Advisory Panel recently delivered recommendations on a NOPP ocean education strategy to the NORLC. Preparation of a comprehensive NOPP strategic plan is now underway.

II. Introduction

The FY 1997 Defense Authorization Act (P.L. 104-201) directed the Secretary of the Navy to establish the National Oceanographic Partnership Program (NOPP). Supplemental legislation for appointments to the NOPP oversight body, the National Ocean Research Leadership Council (NORLC), and the Ocean Research Advisory Panel (ORAP) is contained in Public Law 105-85, the FY 1998 Defense Authorization Act.

The Secretary of the Navy is charged in Subtitle E of title II, Division A, Public Law 104-201 to establish a National Oceanographic Partnership Program to:

- 1) promote the national goals of assuring national security, advancing economic development, protecting quality of life, and strengthening science education and communication through improved knowledge of the ocean; and
- 2) coordinate and strengthen oceanographic efforts in support of those goals by:
 - a) identifying and carrying out partnerships among Federal agencies, academia, industry, and other members of the oceanographic scientific community in the areas of data, resources, education, and communication, and
 - b) reporting annually to Congress on the Program.

This report addresses the latter component of the statutory requirement.

NOPP Organization: The NOPP organizational chart is shown below.

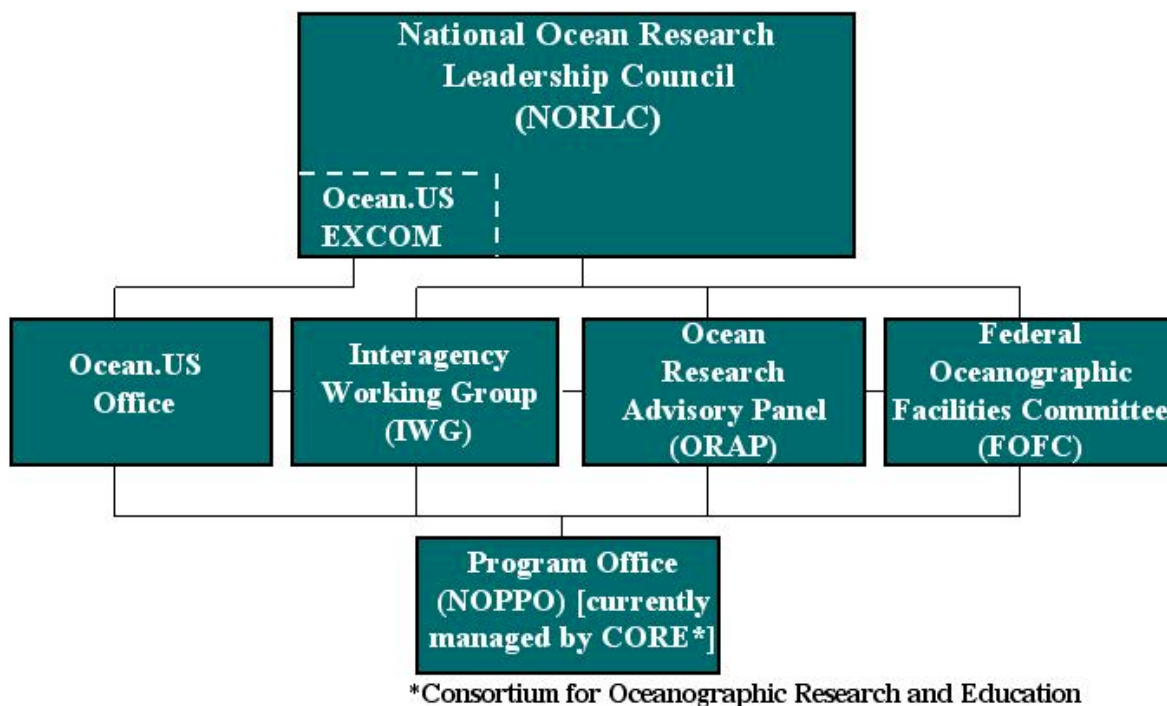


Figure 1. NOPP Organizational Chart

The **National Ocean Research Leadership Council (NORLC)** is the decision-making body of NOPP. The Council confirms Program activities and funding opportunities and is composed of the heads of fifteen federal agencies that are involved in conducting or funding ocean research or developing ocean research policy. . The current list of members can be found in Appendix 1.

The **Ocean Research Advisory Panel (ORAP)** provides advice and scientific guidance to NOPP. It is composed of representatives from the National Academies, ocean industries, state governments, academia, and other organizations/communities as appropriate. . The current list of members can be found in Appendix 2.

The **Federal Oceanographic Facilities Committee (FOFC)** advises the NORLC on policies, procedures, and plans relating to oceanographic facility use, upgrades, and investments. Membership is composed of federal oceanographic facilities managers. . The current list of members can be found in Appendix 3.

The **Interagency Working Group (IWG)** performs staffing functions assigned by, and on behalf of, the NORLC. Membership reflects that of the NORLC. . The current list of members can be found in Appendix 4.

The **Ocean.US Executive Committee (EXCOM)** serves as the oversight body for the Ocean.US Office. Membership is composed of NOPP agencies that are both party to the Ocean.US Memorandum of Agreement and have provided personnel or other resources to the Ocean.US Office.

The **Ocean.US Office** serves as the national focal point for integrating ocean observing activities. Its goal over the next decade is to integrate existing and planned elements to establish a sustained ocean observing system to meet common research and operational agency needs.

The **National Oceanographic Partnership Program Office (NOPPO)** was established by the NORLC to assist in the management of NOPP and provide daily administrative support. Using competitive procedures, a 5 year contract for the operation of the NOPPO was awarded to the Consortium for Oceanographic Research and Education (CORE) on 14 July 1997. The NOPPO contract was re-competed in 2002 and was awarded to CORE on 5 February 2003.

III. NOPP Investment Strategy

The five elements of the NOPP Investment Strategy (described below) are based on the NORLC Report “Toward a U.S. Plan for an Integrated, Sustained Ocean Observing System.”

- A. Operational/Routine Observations. This NOPP investment area is for operational observation efforts, including demonstrations and pilot projects that may lead to new operational capabilities. Sustained, long-term, routine observations are used to generate products responding to user-defined needs or requirements.
- B. Research “Observatories”. This NOPP investment category includes observational efforts such as long time-series research, which will yield important fundamental

discoveries about how the ocean and its ecosystems interact over time, and will lead to optimization of operational observing systems. Knowledge of the mechanisms of long-term climate change and its effect on fish stock fluctuations, for instance, is essential to designing effective systems to monitor and predict fish stock fluctuations and permit operational catch quotas annually. NOPP has funded the development of integrated coastal observatories (e.g., LEO-15 off New Jersey), and the conceptual design of sea floor observatory networks further offshore (e.g., NEPTUNE), which could potentially monitor the biological productivity and fish stocks over a large area of the continental shelf. Additional existing open ocean time-series, such as the Hawaiian Ocean Time-Series (HOTS) and Bermuda Area Time Series (BATS), could also eventually be coordinated and integrated into the Integrated Ocean Observing System (IOOS) data streams.

- C. Observational Technique Development. NOPP is interested in the development and/or demonstration of coastal and open ocean observational instrumentation, platforms and techniques to establish new means for continuous, high-resolution measurements of oceanic processes. A principal challenge in this area is to develop rapid analytical techniques and “smart” sampling tools based on real-time measurements.

NOPP is particularly interested in:

1. autonomous and/or long-term and/or distributed approaches that provide new observational capabilities for the ocean community, and
 2. Innovative sensors and measurement techniques to obtain long-term data on oceanographic variables for which technology is less advanced (e.g., chemical, optical, or biological) to better integrate observations with physical variables.
- D. “Commons” for Ocean Information. The Partnership Program has initiated several efforts toward a community-wide, linked ‘system’ of resources, collaborations, and elements for ocean observing and predicting activities. The genesis for this initiative was a series of workshops in 1997 (led by Worth Nowlin) and 1998 (led by Tom Powell) illuminating the need for an Ocean Research Synthesis and Modeling Program (ORSMP) which garnered further impetus and definition with the publication of the NORLC report “Toward a U.S. Plan for an Integrated, Sustained Ocean Observing System” in April 1999. Background on the workshops can be found in Nowlin (1997) and Powell (1998), available through the NOPP web site at <http://www.nopp.org>.

To address these needs, new infrastructure and partnerships are required that span the ocean community. A concept that has been developed to address these needs involves a central “hub facility” supporting a number of “nodes” that can evolve in a phased manner. The hub (or hubs) will provide computational and data assimilation capabilities, high-level analyses, technical assistance, code and analysis software, benchmark solutions, documentation, and other services. Nodes are envisioned as small to large teams (5-15 researchers) collaborating on model/data synthesis projects requiring regional- to global-scale computational capability.

- E. Outreach/Education. As science literacy grows in importance, the oceans readily provide an exciting vehicle to stimulate learning and promote math and science education. NOPP seeks to invest in projects directly addressing public education.

IV. NOPP Investment Profile

Overall fiscal investment in NOPP has increased since startup in 1997 and can best be described in terms of NOPP Funded Activities and NOPP Related Activities. NOPP Funded Activities are those that are either solicited or managed by NOPP and involve support from two or more agencies. NOPP Related Activities are those that are funded primarily by a single agency in response to plans produced by NOPP entities. Both types of activities have grown since NOPP's inception.

NOPP FUNDED ACTIVITIES

Figure 2 shows the growth of NOPP Funded Activities from 1997-2002 as well as the breakdown by subcategory for Solicited Projects and Managed Activities. In 2002, the total funding was \$26M.

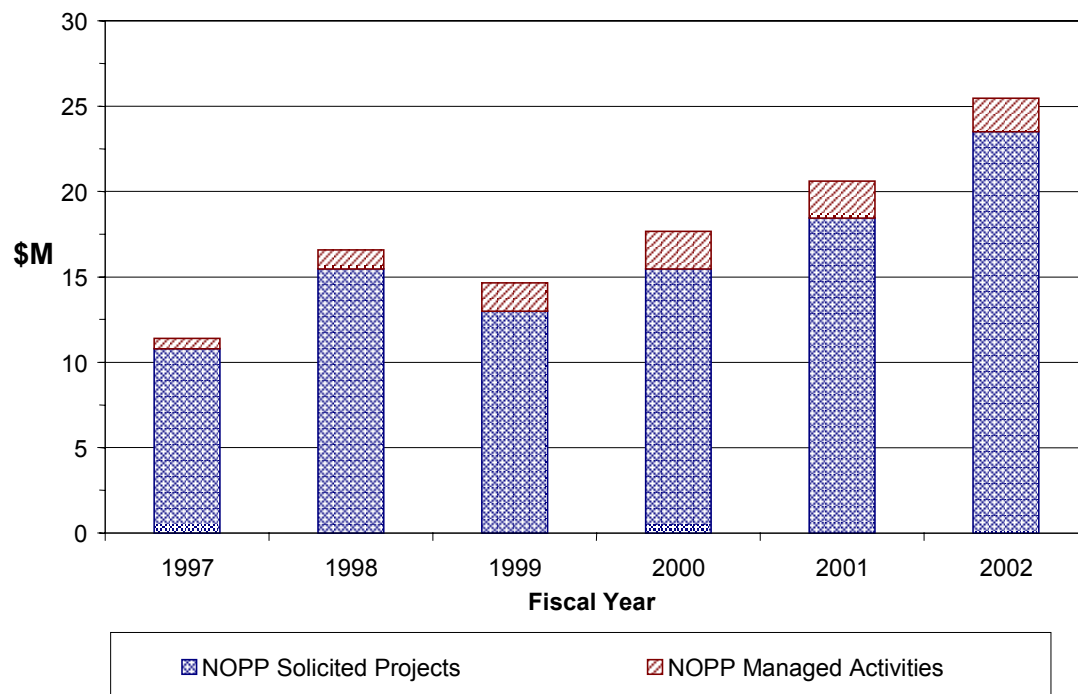


Figure 2. FY 1997-2002 Investment in NOPP Funded Activities, including both NOPP Solicited Projects and NOPP Managed Activities. Note that the dollar amounts shown are those spent each year; out-year commitments are not shown.

NOPP Solicited Projects

NOPP Solicited Projects are those funded as a direct result of a formal NOPP Broad Agency Announcement (BAA) or Request For Proposals (RFP). The funding level for solicited projects has grown from \$12M in 1997 to \$24M in 2002 (Figure 2). The cumulative investment over six years is \$97M. Through 2002, there have been 82 funded projects, including 20 renewal projects. On average, 15 new projects are started each year, with a typical duration of three years.

One of the primary functions of NOPP is to promote partnerships within the Federal government and between the Federal government and other members of the ocean science community – including academia, industry and non-governmental organizations. Figure 3 shows the annual distribution of funding for NOPP Solicited Projects across sectors within the ocean science community. The bar on the right indicates the sector averages over 1997-2002. Approximately 62%, 18%, 11% and 9% were awarded to academia, government, industry and non-governmental organizations/others, respectively.

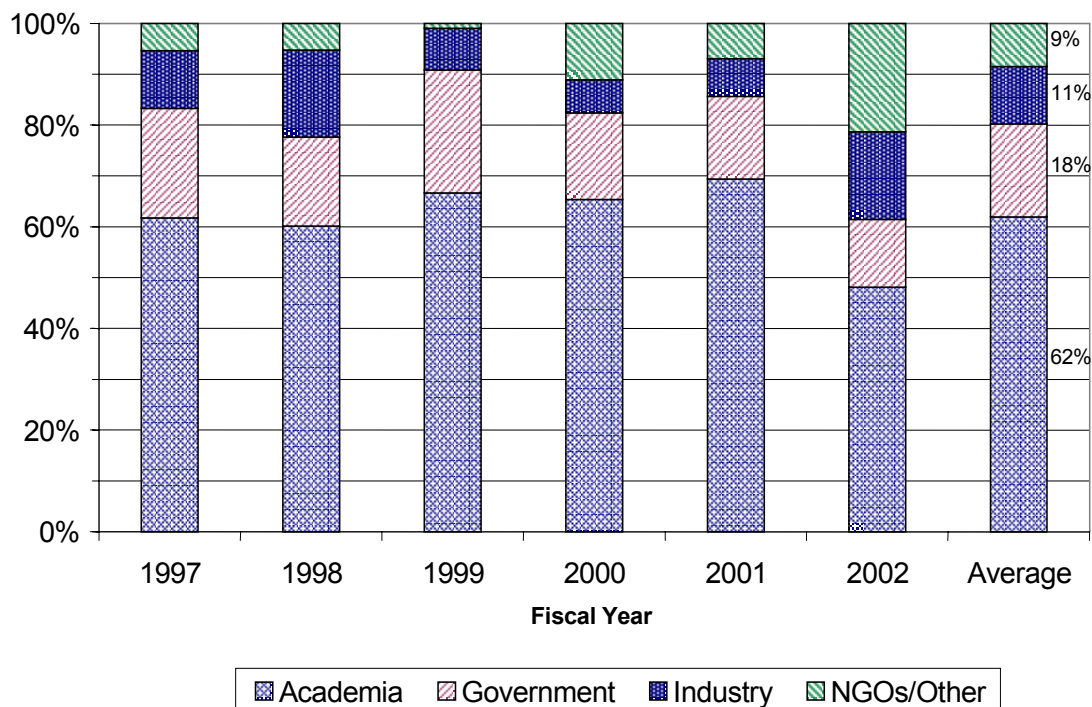


Figure 3. Bar graph showing the NOPP funding for solicited projects by sector from 1997-2002 for academia, government, industry and NGOs/others. The bar on the right indicates the six year sector average

NOPP Managed Activities

NOPP Managed Activities include expenditures for the NOPP Office, the Ocean.US office, the National Ocean Science Bowl, the Ocean Information Technology Infrastructure initiative, the Virtual Ocean Data System and the Year of the Ocean Drifters. The cumulative expenditure for these activities is \$9.5M from 1997-2002 (Figure 2).

NOPP RELATED ACTIVITIES

In addition to NOPP Funded Activities, individual agencies invest in NOPP Related Activities. Examples include new investments in activities overseen by NOPP entities such as Ocean.US and FOFC. These investments fulfill the broad cross-cutting oceanographic goals and partnerships embraced by NOPP, but are primarily single agency expenditures. Significant new investments in NOPP Related Activities are anticipated over the next decade.

V. Fiscal Year 2002 Activities

NOPP FUNDED ACTIVITIES

NOPP Solicited Projects

The NOPP agencies and the Sloan Foundation invested approximately \$24M in NOPP-solicited projects in FY 2002 using two Broad Agency Announcements (BAA). The first FY 2002 NOPP BAA focused on the Ocean Biogeographical Information System and was issued on September 28, 2001. The two investment areas solicited were Observational Technique Development (Topic C) and the "Commons" for Ocean Information (Topic D). This was the second funding collaboration with the Alfred P. Sloan Foundation. The solicitation is reproduced in Appendix 5.1.

The second FY 2002 NOPP BAA was issued on 21 February 2002. The announcement requested proposals in three investment areas: Operational/Routine Observations with specific respect to Economic Benefit-Cost Studies of Regional Coastal Ocean Observing Systems, Surface Vector Winds, and Seas Surface Temperature (Topic A), Observational Technique Development (Topic C) and Outreach/ Education (Topic E). The solicitation is reproduced in Appendix 5.2. Both solicitations employed a peer-review process and awards were approved by the IWG on behalf of the NORLC. In total, twenty-nine proposals were received and eleven were funded, including three project renewals. The funded projects are listed below and project summaries are provided in Appendix 6.

TOPIC A. OPERATIONAL/ROUTINE OBSERVATIONS

- “Coordinated Regional Benefit Studies of Coastal Ocean Observing Systems,” Lead PI: Dr. Hauke Kite-Powell (Woods Hole Oceanographic Institution)
- “Operational Utilization of High Resolution Ocean Surface Wind Vectors (25km or better) in Marine Forecasting and High Resolution Regional NWP Models,” Lead PI: Dr. Paul Chang (NOAA/NESDIS/OAR)

TOPIC C. OBSERVATIONAL TECHNIQUE DEVELOPMENT

- “Developing Gene-Based Remote Detection,” Lead PI: Dr. Kelly Goodwin (NOAA/AOML)
- “Multi-disciplinary Ocean Sensors for Environmental Analyses and Networks,” Lead PI: Dr. Tommy Dickey (University of California, Santa Barbara)

“The Environmental Sample Processor (ESP): A Device for Detecting Microorganisms In Situ Using Molecular Probe Technology,” Lead PI: Dr. Christopher Scholin (Monterey Bay Aquarium Research Institute)

“Accelerating Electronic Tag Development for Tracking Free-Ranging Marine Animals at Sea,” Lead PI: Dr. Barbara Block (Stanford University)

TOPIC D. "COMMONS" FOR OCEAN INFORMATION

“Digital Archival of Marine Mammal/Bird/Turtle Data for OBIS,” Lead PI: Dr. Andrew Read (Duke University)

TOPIC E. OUTREACH / EDUCATION

“Enhancing K-12 Science Education via Satellite-televised Interactive Technologies,” Lead PI: Dr. Paula Coble (University of South Florida)

RENEWAL OF EXISTING NOPP PROJECTS

“The BRIDGE,” Lead PI: Dr. Francis Larkin (Virginia Sea Grant)

“Incorporation of Sensors into Autonomous Gliders for 4-D Measurement of Bio-optical and Chemical Parameters,” Lead PI: Dr. Charlie Eriksen (University of Washington)

“A Proposal to Assess and Expand the COOL Classroom: A Web Site to Bring Real-time data from the Long-term Ecosystem Observatory (LEO) to 6-12 Grade Classrooms,” Lead PI: Dr. Michael De Luca (Rutgers).

NOPP Managed Activities

This is the 6th year of the NOSB, which has grown to encompass 24 sites (2 new this year), 380 high schools, coaches (teachers/parents) and 1700 students. Some significant changes include three diversity initiatives at sites in California and a format that places more emphasis on critical thinking skills. Additional information on the NOSB and other education projects can be found on the NOPP web site at <http://www.nopp.org>

The Ocean Information Technology Infrastructure Steering Committee, supported by Navy and NSF, published a report in January 2002 entitled "An Information Technology Infrastructure Plan to Advance Ocean Sciences." The report addresses future information technology needs of the ocean science community.

The National Oceanographic Partnership Program held a Town Meeting at the American Geophysical Union/American Society of Limnology and Oceanography (AGU/ASLO) Ocean Sciences meeting on February 13, 2002. Federal officials from the NOPP Interagency Working Group (IWG) provided an overview of recent developments in the NOPP program. Future plans for NOPP were discussed, including an update on the evolving plans to develop routine ocean observations of U.S. coastal and open ocean waters.

NOPP RELATED ACTIVITIES

In addition to the NOPP-Funded Activities described above, individual agencies invested in NOPP Related Activities. Significant examples of such investments included a military ocean survey and several projects related to the development of an Integrated Ocean Observing System.

An ocean survey using academic research vessels to address validated Navy survey requirements concluded in FY 2002, bringing the total Navy investment to over \$32 million. The schedule for 2002, which was developed by UNOLS and the Naval Oceanographic Office, is included in Appendix 7.

Several examples of NOPP-related investments are linked to the development of the Integrated Ocean Observing System. The Office of Naval Research awarded two Phase II SBIR contracts in March 2002. These contracts provided for the distribution of approximately 100 Iridium L-Band Transceivers (LBTs), i.e., data modems, to the oceanographic community for evaluation. Both Navy and NOAA also support coastal observatory efforts. ONR manages several operational oceanography efforts in regional waters, including the South East Coastal Ocean Observing System (SEA-COOS) and the Gulf of Maine Observing System (GoMOOS). NOAA is providing more than \$13 million to seven Coastal Observation Technology System (COTS) projects in FY 2002. The COTS projects are designed to further the development of integrated coastal ocean observing systems on a regional basis and are further described in Appendix 8.

NATIONAL OCEAN RESEARCH LEADERSHIP COUNCIL

The National Ocean Research Leadership Council met on December 4, 2001 and May 23, 2002. The minutes of the meetings are available on the NOPP web site at <http://www.nopp.org>. The NORLC granted the Interagency Working Group (IWG) approval authority for project awards resulting from the FY 2002 Broad Agency Announcements. At the December meeting, the NORLC accepted FOFC's Long-Range Plan for Renewal of the Academic Research Fleet.

OCEAN RESEARCH ADVISORY PANEL

The Ocean Research Advisory Panel met on October 23, 2001 and April 2, 2002. The minutes of the meetings are available on the NOPP web site at <http://www.nopp.org>. Discussion topics included development of ORAP recommendations on a NOPP education strategy, the relevance of the integrated ocean observing system to homeland security, and the renewal of the academic fleet.

FEDERAL OCEANOGRAPHIC FACILITIES COMMITTEE

The Federal Oceanographic Facilities Committee met twice in FY 2002, on November 16, 2001 and April 1, 2002. The FOFC Fleet Renewal Plan "Charting the Future for the National Academic Research Fleet" was reviewed and accepted by the NORLC in December 2001. Other areas under FOFC consideration include research aircraft, autonomous underwater and remotely operated vehicles, and platforms for distributed and/or networked observations.

2002 NOPP AWARD FOR EXCELLENCE IN PARTNERING



Award Ceremony for the NOPP 2002 Award for Excellence in Partnering.

From left to right: Dr Rao (NOAA), Dr. Aikman (NOAA), Dr. Boesch (U.MD), Dr. McQueen (NOAA), VADM Lautenbacher (NOAA), Mr. Gildersleeve (WSI), Dr. Colwell (NSF), Ms. Livingstone (Navy), Mr. Berry (NorthrupGrumman-TASC, Inc.), Dr. Ginis (U.RI), CAPT Klein (former Navy Deputy to NOAA, USN Ret.), Dr. Briscoe (ONR).

At the January 9, 2003, NORLC meeting, Dr. Rita Colwell awarded the 2002 NOPP Award for Excellence in Partnering to the Coastal Marine Demonstration of Forecast Information to Mariners for the U.S. East Coast Project (CMDP), an integrated system of nowcast and forecast products of value to mariners. Dr. Don Boesch (U. Maryland, Horn Point Laboratory) accepted the award on behalf of CMDP and the lead PI, Dr. Leonard Walstad. Over a two-year period CMDP ocean forecast products were made available via the Internet to marine customers in the Chesapeake Bay and surrounding coastal areas. Based on user feedback, CMDP determined that these forecasts were of significant value to a broad community of commercial, government, recreational and educational users, leading to the operational use and proposed expansion of the system. This system can be accessed through the National Weather Service at <http://www.nws.noaa.gov/> or directly at <http://polar.wmb.noaa.gov/cofs/>. The Coastal Marine Demonstration Project (CMDP) was selected from among sixty-eight past or present NOPP research projects. A short description of the CMDP and the criteria for selecting the recipient of the Excellence in Partnering Award can be found in Appendix 9.

OCEAN.US/INTEGRATED OCEAN OBSERVING SYSTEM

Ocean.US is an interagency office to promote the development and implementation of a sustained, Integrated Ocean Observing System (IOOS). IOOS will constitute the U.S. contribution to a Global Ocean Observing System (GOOS) and reflects increasing interest in expanding the operational capabilities of oceanography. A full-time staff is now assigned to this office, supplemented by a committee of users, the U.S. GOOS Steering Committee. To date, nine agencies have agreed to participate. Representatives of these agencies comprise an Executive Committee that provides oversight and guidance to the Office.

The office is initially charged with documenting a set of integrated requirements and capabilities for consideration by the agencies. Efforts are also underway to define more specifically the observational activities to be encompassed by Ocean.US. Two components -- a global, oceanic component and a national coastal component -- are being developed concurrently. The system will be a federation of existing and new elements, providing full and open access to ocean data.

BUILDING CONSENSUS: Toward An Integrated and Sustained Ocean Observing System

Airlie House Workshop
Warrenton, VA
March 10-15, 2002

Ocean.US convened a national workshop in March 2002 to provide guidance for the phased implementation of a sustained and integrated ocean observing system. The report of the workshop responded to a request from the House Resources Committee for an interagency plan. Approximately 100 participants from Federal, state, and local agencies; academia; non-governmental organizations; and private industry represented diverse areas of expertise including biology, oceanography, chemistry, physics, geology, geophysics, engineering, and economics.

The first task of the workshop was to reach a consensus on the goals and initial products to address each of seven Ocean.US themes. The results were then used to develop a comprehensive list of potential variables to be measured as well as observational techniques. The highest ranked variables, which were categorized as “Physical”, “Chemical” or “Biological”, would then form the national “backbone”. Techniques were evaluated based on their feasibility and anticipated ability to meet the observational needs for the seven themes. The elements identified were then described as:

- Ready to implement now, i.e, Operational;
- Pre-operational;
- Pilot Project; or
- Research and Development.

Immediate actions recommended include:

- Accelerating the implementation of the U.S. commitment to observations needed for assessment and prediction of climate change;
- Initiating a data communications and management sub-system;
- Expanding existing Federal observing systems such as buoys and water level measurements; and
- Initiating regional observing systems as proof-of-concept projects.

Highest priority was given to establishing the integrated subsystem for data communications and management that transcends government agencies, individual monitoring programs, and research institutions. The workshop also addressed the importance of identifying socio-economic benefits of the observing system, noting that cost-benefit analyses need to be performed, with initial emphasis on those products that have high potential for a significant return-on-investment.

VI. Fiscal Year 2003 Activities and Plans

NOPP FUNDED ACTIVITIES

FY 2003 anticipated agency contributions for NOPP Funded Activities and associated investment areas are indicated in Table 1.

Table 1. Anticipated Fiscal Year 2003 Agency Contributions to NOPP Funded Activities by Investment Area. This includes Solicited Projects (projects solicited through NOPP BAAs and RFPs) and Managed Activities. Since award decisions from the FY 2003 NOPP GODAE RFP have not yet been made, these figures represent anticipated expenditures only.

	N A V Y	N O A A	N S F	N A S A	M M S	D O E	E P A	U S A C E	U S G S	D O S	U S C G	O S T P	O M B	D A R P A
Operational / Routine Observations	X	X		X										
Research Observatories	X		X		X									
Observational Technique Development	X		X	X	X		X							
Commons for Ocean Information	X		X	X			X							
Outreach / Education (including NOSB)	X	X	X	X	X	X	X		X					
Management Costs (including NOPP / Ocean.US Offices)	X	X	X	X	X			X	X					
FY 2003 Anticipated Expenditures (\$M)	10.0	8.2	4.0	4.0	0.4	*	*	*	*	0	0	0	0	0

*anticipated expenditures of less than \$100K

NOPP Solicited Projects

A Request For Proposals was issued by NOAA on December 11, 2002 for implementing the initial, pre-operational U.S. contribution(s) to the Global Ocean Data Assimilation Experiment (GODAE). GODAE will be a pilot project under Ocean.US. Funded jointly by Navy and NOAA, the funding levels for each year are dependent on appropriations but are expected to be \$1.5M, \$2.5M, and \$4.5M, respectively, for three years beginning in FY 2003. Depending on progress, it is expected that the level of funding for the third year will continue for two additional years. The program will employ a competitive peer-review process and awards will be approved by the NORLC. The solicitation is included as Appendix 5.3.

NOPP Managed Activities

The Finals of the National Ocean Science Bowl will be held in La Jolla, California April 27-28, 2003. In terms of outreach, the National Oceanographic Partnership Program has held activities at both the Marine Technology Society meeting (Biloxi, MS, October, 2002) and the American Geophysical Union meeting (San Francisco, December, 2002). Activities are also planned for the American Society of Limnology and Oceanography (ASLO, Salt Lake City, February) and The Oceanography Society (TOS, New Orleans, LA, June) meetings.

NOPP RELATED ACTIVITIES

NOAA will continue to provide support for the Coastal Observation Technology System (COTS) projects (see Appendix 8 for a description of those projects). The FY 2003 funding level for COTS is expected to be \$15.7 million.

NATIONAL OCEAN RESEARCH LEADERSHIP COUNCIL

The National Ocean Research Leadership Council met on January 9, 2003. Highlights included discussion of ORAP's recommendations for a NOPP education strategy, the need for a NOPP strategic plan, and the development of an implementation plan for the Integrated Ocean Observing System. The Council also discussed the merits of linking a proposed joint subcommittee of the NSTC's Committee on Science and Committee on Environment and Natural Resources to the National Oceanographic Partnership Program.. The minutes of this meeting are available on the NOPP web site at <http://www.nopp.org>.

OCEAN RESEARCH ADVISORY PANEL

At present there are two members of the ORAP committee, two pending re-appointments and 11 pending nominations. Confirmation of the outstanding appointments is expected prior to the Spring 2003 ORAP meeting.

At the January 9, 2003, NORLC meeting, the Chair of ORAP presented recommendations for a NOPP education strategy. The strategy included goals to: initiate, strengthen, and sustain education and outreach programs, use infrastructure of NOPP partners and programs to advance ocean literacy, promote a diverse workforce, and develop a policy and investment plan that will

sustain ocean educational infrastructure. In addition to discussing the education strategy, the NORLC provided ORAP with guidance on future activities.

FEDERAL OCEANOGRAPHIC FACILITIES COMMITTEE

The Federal Oceanographic Facilities Committee (FOFC) met on November 13, 2002. In planning for implementation of the Academic Fleet Replacement Plan, FOFC has conducted work on vessel design. The Office of Naval Research recently completed a common hull study for Ocean and Regional class vessels. NSF funded a design study for the Alaska Region Research Vessel that is nearing completion. In terms of implementation planning, NSF continues to consider constructing the ARRV as a MREFC project and is examining options for funding construction of the Regional class vessels. However, both funding options must be approved by the National Science Board before NSF may proceed further. FOFC is developing multiple options for funding the implementation plan. In addition, a brochure on Federal aircraft research facilities is nearly complete, and the FOFC will continue to evaluate other facilities important to the oceanographic community.

OCEAN.US / INTEGRATED OCEAN OBSERVING SYSTEM

Based on results of the March 2002 workshop, Ocean.US is working with the EXCOM to develop a phased implementation plan for achieving an integrated and sustained ocean observing system over the next 5 to 10 years. This plan is to be completed by the Spring of 2003, following guidance from those who are conducting ocean observing activities now along the U.S. coastline. A representative group of these practitioners will meet in Washington, D.C. March 31-April 1, 2003 to set up a "national federation" of regional observing systems.

In the House Armed Services Committee report on H.R. 1401 (H. Rept. 106-162), the Committee requests that the "Secretary of the Navy, in his role as a member of the National Ocean Research Leadership Council, encourage the Council to develop standards and plans for the establishment and administration of an integrated ocean and coastal observing system that provides for long-term, continuous, and real-time observations of the coastal oceans of the United States and to report those plans to Congress in the Council's next annual report on the National Oceanographic Partnership Program." See Appendix 10 for details on progress in these areas.

VII. Fiscal Year 2004 Plans

Agency-specific budget requests for the Fiscal Year 2004 Budget are pending before Congress; therefore precise funding levels and associated programmatic issues cannot be identified. The NOPP agencies anticipate contributions to NOPP to be comparable to that of Fiscal Year 2003 and will continue to support the existing five investment areas:

- Operational/Routine Observations;
- Research "Observatories";
- Observational Technique Development;

- “Commons” for Ocean Information; and
- Outreach/Education.

Additional areas of investment may be considered.

VIII. Interagency Coordination activities

The central tenet of NOPP is interagency cooperation. The most recent activities are described in previous sections of this report. The primary thrust of the NOPP over the next few years will be development and implementation of a national integrated ocean observing system coordinated by the Ocean.US office. FOFC continues to coordinate efforts aimed at oceanographic facilities of interest to multiple agencies.

The NOPP role with the Commission on Ocean Policy continues to be productive. The Chair of FOFC, Dr. Margaret Leinen, testified before the Commission in April 2002. The Chair of the NORLC, Dr. Rita Colwell, testified in July 2002. Admiral Watkins spoke with the NORLC at the May 2002 NORLC meeting and, with the Commission’s recommendations presently expected in the Summer of 2003, the NORLC expects to discuss their findings at an upcoming meeting.

The NORLC held a discussion at its January 2003 meeting on linking NOPP more closely with the National Science and Technology Council through the proposed establishment of a Committee on Science (CS) and Committee on Environment and Natural Resources (CENR) Joint Subcommittee on Oceans.. Discussion continues on how this can best be accomplished.

Appendix 1. National Ocean Research Leadership Council (NORLC) List of Committee Members

As of February 2003

National Science Foundation (Chair)	Dr. Rita Colwell, Director
Navy (Vice-Chair)	Mr. Hansford T. Johnston, Secretary of the Navy (Acting)
National Oceanic and Atmospheric Administration (Vice-Chair)	VADM Conrad C. Lautenbacher, USN (Ret.), Administrator of NOAA/Under Secretary for Oceans and Atmosphere, U.S. Department of Commerce
National Aeronautics and Space Administration	Mr. Sean O’Keefe, Administrator
Department of Energy	Mr. Kyle E. McSlarrow, Deputy Secretary
Environmental Protection Agency	Ms. Christine Todd-Whitman, Administrator
United States Coast Guard	ADM Thomas H. Collins, Commandant
United States Geological Survey	Dr. Charles Groat, Director
United States Army Corps of Engineers	Mr. George S. Dunlop, Deputy Assistant Secretary of the Army (Civil Works) for Policy
Minerals Management Service	Ms. Rejane Burton, Director
Office of Management and Budget	Mr. Mitchell E. Daniels, Director
Department of State	Mr. John Turner, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs
Office of Science and Technology Policy	Dr. John H. Marburger, III, Director
Defense Advanced Research Projects Agency	Dr. Anthony J. Tether, Director
Department of Homeland Security	Dr. Charles E. McQueary, Undersecretary for Science and Technology

Appendix 2. Ocean Research Advisory Panel (ORAP) List of Committee Members

As of January 2003

Dayton L. Alverson, Natural Resources Consultants, Inc
Paul L. Kelly, Rowan Companies, Inc.

Nominated

Marcia McNutt*, Monterey Bay Aquarium Research Institute
Lawrence Dickerson*, Diamond Offshore Drilling, Inc.
Nancy Rabalais, Chair, Ocean Studies Board, NAS
Philip Merilees‡, National Center for Atmospheric Research (ex: NRL Monterey)
Ellen Prager‡, Storm Center Communications, Inc. (ex: U. of Miami)
L. Donelson Wright‡, Virginia Institute of Marine Science
Andrew Clark‡, Maritime Communication Services, Inc.
William Wright‡, Royal Caribbean Cruises Ltd.
Jesse Ausubel‡, Alfred P. Sloan Foundation
Stephen Weisberg‡, Southern California Coastal Water Research Project Authority
Joseph Pickard+, Environet, Inc.
Terry Garcia, National Geographic Society
Denise Stephenson-Hawk*, Chairman, The Stephenson Group (ex: Clark Atlanta U.)

Pending

Valerie Chase‡, (ex: National Aquarium)
Matthew Gilligan‡, Savannah State University
Marlon Lewis‡, Satlantic
Richard Seymour‡, Scripps Institution of Oceanography

‡ Pending appointment

* Pending re-appointment

+ Nominated by Senator Akaka

Appendix 3. Federal Oceanographic Facilities Committee (FOFC) List of Committee Members

As of February 2003

Dr. Margaret Leinen (Chair)	National Science Foundation
Dr. Frank Herr	Office of Naval Research
RADM Thomas J. Wilson	Oceanographer of the Navy
RADM Evelyn Fields	National Oceanic & Atmospheric Administration
CAPT Charles T. Lancaster	U.S. Coast Guard
Kennard W Potts	U.S. Environmental Protection Agency
Dr. Ronald Lai	Minerals Management Service
Margaret F. Hayes	Department of State
Dr. Bill Birkemeier	U.S. Army Corps of Engineers
Dr. Anna Palmisano	Department of Energy
Dr. John Haines	U.S. Geological Survey
Dr. William Emery	National Aeronautics and Space Administration
Dr. Thomas J. Green, Jr.	DARPA Advanced Technology Office

Appendix 4. Interagency Working Group (IWG) List of Committee Members

As of February 2003

National Science Foundation (Chair)	Dr. James Yoder
Navy (Vice-Chair)	Dr. Melbourne Briscoe
National Oceanic and Atmospheric Administration (Vice-Chair)	Dr. Jamie Hawkins
National Aeronautics and Space Administration	Dr. William Emery
Department of Energy	Dr. Anna Palmissano
Environmental Protection Agency	Dr. Paul Pan
United States Coast Guard	Dr. Jonathon Berkson
United States Geological Survey	Dr. John Haines
United States Army Corps of Engineers	Mr. William Birkemeier
Minerals Management Service	Dr. James Kendall
Office of Management and Budget	Mr. Gary Reisner
Department of State	Ms. Constance Arvis
Office of Science and Technology Policy	Dr. David Halpern
Defense Advanced Research Projects Agency	Dr. Anthony Tether (TBD)
Department of Homeland Security	Dr. Charles McQueary (TBD)
Ex Officio Members	
Chair EXCOM	Dr. Richard Spinrad
Chair FOFC	Dr. Margaret Leinen
Director Ocean.US	Dr. Eric Lindstrom

Appendix 5. National Oceanographic Partnership Program Broad Agency Announcements (BAA) and Requests for Proposals (RFP)

5.1 2002 BAA FOR THE OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM (OBIS)

Fiscal Year 2002 National Oceanographic Partnership Program BAA for the Ocean Biogeographical Information System (OBIS)

PART: U.S. Government Procurements

SUBPART: Services

CLASSCOD: A--Research and Development

OFFADD: Office of Naval Research, 800 North Quincy St., Arlington, VA 22217-5660

SUBJECT: A--National Oceanographic Partnership Program

SOL: 01-029

POC: Mr. Brian Glance ONR Code 252, (703) 696-2596

DESC: On behalf of the National Oceanographic Partnership Program (NOPP), the Office of Naval Research (ONR) solicits research proposals meeting the goal and purpose of the Partnership Program outlined in Title II, subtitle E, of Public Law 104-201.

Up to \$6.0M (over 3 years) may be available for this solicitation, subject to appropriation and final approval by the National Ocean Research Leadership Council (NORLC). Proposals are due by 4 pm EST, Thursday, December 18, 2001. Team efforts among academia, industry, and government participants are required (at least 2 of the 3). Cost sharing or proposals augmenting ongoing partnership efforts are very strongly encouraged.

NOPP Background Information: The central focus of the Partnership Program is an integrated and sustained ocean observation system achieved by a federation of many elements to support a wide range of users. The following five Investment Areas form the basis of the NOPP Investment Portfolio:

- A) Operational/Routine Observations (including pilots, testbeds, etc.),
- B) Research "Observatories" (long-term experiments and data series, etc.),
- C) Observational Technique Development (sensors and platforms),
- D) "Commons" for Ocean Information ("hubs" and "nodes", etc.),
- E) Outreach/Education.

This solicitation specifically addresses just two of these areas; the Observational Technique Development (Topic C) and the "Commons" for Ocean Information (Topic D) Investment Areas. Topics A, B and E may be addressed in other, later solicitations.

The Census of Marine Life (CoML) is a concept developed over the past few years with the support of the Alfred P. Sloan Foundation. In June 1999, a decision was made by the science ministers of 29 countries to establish a Global Biodiversity Information Facility (GBIF). In FY2000, NOPP and the Sloan Foundation jointly funded research to initiate the design and development of the Ocean Biogeographical Information System (OBIS) architecture within the "Commons" for Ocean Information area; a description of those projects can be found on the NOPP webpage, [www.nopp.org], under NOPP Funded Projects, FY2000 Projects.

The Sloan Foundation and NOPP seek proposals that will capitalize on the initial effort begun in FY2000 to: 1) further develop and populate the databases of the OBIS, and 2) initiate prototype data collections for inclusion in CoML, using novel sensor technologies.

TOPIC C-OBIS2. Novel Approaches to Marine Biological Data Collection

Partnership proposals are sought for the application of novel sensor technologies to the collection of marine biological data for OBIS. The technology should therefore be capable of delivering data that meet the data and metadata standards of OBIS, GBIF, VODHub (see NOPP website) and other relevant biogeographic data systems. Technologies which deliver increased amounts of data for less time, effort or cost than current methods; and/or are able to deliver difficult-to-obtain or novel biological data, or biological data with correlated physical environmental data, of relevance to the goals of OBIS and related programs are of particular interest. Technology should comply with applicable marine mammal and environmental laws and regulations. International partnering is encouraged, but is not required. Proposals should have a plan for application of the technology on a significant scale by 2004. NOPP envisions support for 1-2 projects in this topic not to exceed \$1M per year over three years.

TOPIC D-OBIS2. Digital Archival of Existing Data.

Partnership proposals are sought for the compilation of currently available geo-referenced species abundance datasets of marine mammals, birds and/or reptiles, to compliment similar ongoing compilations of fish and marine invertebrate data sets (see the NOPP website for NOPP Funded Projects and Investment Areas). Appropriate datasets may include commercial harvest data, museum collections, contemporary directed survey, and remote sensing data, or any other source of data that would contribute to analyses of trends in distribution and relative abundance. The PIs should plan to work with the groups developing the metadata and documentation standards for OBIS and the VODHub to ensure that the databases developed under these grants are completely compatible with those systems.

Databases should offer coverage of global, ocean basin scale or large regional areas, and should include multiple species, preferably all member species of at least one of the three vertebrate classes listed above. Input data should be identified at least to the species level (stock or population information is desirable, if available), and data should be geo-referenced to as precise a location as possible. A strategy for handling of intellectual property rights for the data sets described above should be addressed in the proposal. Consortia addressing this topic should include substantial participation by the private sector with most governmental partners via "in kind" participation. In keeping with the OBIS goal of being an effective data repository for all major data gatherers around the world, proposals which include international partners are strongly encouraged.

Completed databases must be made freely and openly available via the Internet as soon as is practical, but by no later than the end of the granting period. In keeping with the Education and Outreach goals of OBIS, Internet databases should be friendly to users from a wide spectrum of abilities and backgrounds. Mechanisms to do this should be described in the proposal, and the costs included in the budget. Close cooperation with relevant government agencies is expected, as well as with existing initiatives and programs such as those already funded as part of OBIS. The efforts presented in the proposals should seek

long-term integration of biological data with other marine data and should demonstrate an awareness of and familiarity with existing long-term observational programs in physical and chemical oceanography.

NOPP envisions support for one to two projects in this Topic not to exceed \$1M per year over three years.

General Instructions and Information

Information regarding proposal format is available under the Broad Agency Announcement section of the NOPP Website <http://www.nopp.org>. E-mail or fax submissions will not be accepted. Twenty copies of the proposals are due not later than 4:00PM EST on Thursday, December 18, 2001 to:

Office of Naval Research
NOPP BAA/ONR 32
Room 407-8
800 N. Quincy Street
Arlington, VA 22217-5660

It is anticipated that awards resulting from this announcement will take the form of grants.

Proposals received at ONR after this date and time will not be considered. All proposals must indicate the BAA number above and which subtopic area is being addressed (e.g., Topic C-OBIS2 or D-OBIS2) on the cover page. Separate proposals must be submitted for each topic or subtopic area. Adobe Acrobat PDF files of the proposals would be especially welcome, and should accompany the proposals on either a floppy diskette(s) or Iomega Zip disk. E-mail and facsimile materials are not acceptable. No request for proposal (RFP), solicitation, or other announcement of this opportunity will be made.

Historically Black Colleges and Universities and Minority Institutions, as determined by the Secretary of Education to meet requirements of 34 CFR Section 608.2 and 10 U.S.C. Paragraph 2323(a)(1)(C), are particularly encouraged to participate.

All proposals will be subject to peer review, which will include non-governmental reviewers. All reviewers will adhere to confidentiality and conflict of interest standards. Evaluations of the proposals will use the following selection criteria: (1) relevance of the proposed research to Partnership objectives, including a) support of critical research objectives or operational goals such as data accessibility, education and communication, b) broad participation within the oceanographic community, c) partners with a long-term commitment to the proposed objectives, d) resources are shared among partners, and e) the degree of cost-sharing by partners with the requested Partnership funding, (2) overall scientific and technical merits of the proposal, (3) the offeror's capabilities, related experience, and facilities or unique combinations of these that are critical to the proposal objectives, (4) the qualifications and experience of the proposed principal investigator and key personnel, (5) degree of significant partnering among at least two of the following parties, academia, industry or government, (6) realism of proposed costs.

A synopsis of the NOPP review process can be found at www.nopp.org.

The final distribution of awards will depend on quality of proposals, programmatic balance, NOPP priorities and availability of funds. Funding estimates for any ship-time must be specifically included in the proposal and the budget should clearly specify the size and type of vessels proposed for use. Ships of opportunity are encouraged. Proposers should include shiptime requests on either the former NSF Form 831 (Shiptime Request Form) or preferably the University-National Oceanographic Laboratory System (UNOLS) on-line request form available at: <http://www.gso.uri.edu/unols/ship/shiptime.html>

Questions regarding business matters relating to this BAA should be directed to:

Office of Naval Research
Attention: ONR 252 Brian Glance
Ballston Towers One
800 N. Quincy St.
Arlington, VA 22217-5660
(703) 696-2596

glanceb@onr.navy.mil.

Technical questions may be submitted by E-mail to NOPPBAA@ONR.NAVY.MIL or by fax to NOPP BAA (703) 696-2007 if necessary.

Correction to the Fiscal Year 2002 National Oceanographic Partnership Program BAA for the Ocean Biogeographical Information System (OBIS)

PART: U.S. GOVERNMENT PROCUREMENTS (MODIFICATION)

SUBPART: SERVICES

CLASSCOD: A--Research and Development

OFFADD: Office of Naval Research, 800 North Quincy Street, Arlington, VA 22217-5660

SUBJECT: A--NATIONAL OCEANOGRAPHIC PARTNERSHIP PROGRAM (NOPP-BAA)

SOL 01-029

DUE 12/18/01

POC Brian Glance ONR Code 252, (703) 696-2596

DESC: The original announcement erroneously stated the name of the day of the week on which proposals are due as Thursday, December 18, 2001. The due date is revised to read "proposals are due by 4 pm EST, Tuesday, December 18, 2001."

CITE: (W-345 SN148P5)

5.2 2002 NOPP PROGRAM BAA

Fiscal Year 2002 National Oceanographic Partnership Program Broad Agency Announcement (As posted on www.onr.navy.mil/02/baa February 21, 2002)

PART: U.S. Government Procurements

SUBPART: Services

CLASSCOD: A--Research and Development

OFFADD: Office of Naval Research, 800 North Quincy Street, Arlington, VA 22217-5660

SUBJECT: A--National Oceanographic Partnership Program

SOL: 02-011

POC: Mr. Brian Glance, ONR Code 252, (703) 696-2596

DESC: On behalf of the National Oceanographic Partnership Program (NOPP), the Office of Naval Research (ONR) solicits research proposals meeting the goal and purpose of the Partnership Program outlined in Title II, subtitle E, of Public Law 104-201.

Up to \$16M may be available for this solicitation, subject to appropriation and final approval by the National Ocean Research Leadership Council (NORLC). Team efforts among academia, industry, and government participants are required (at least 2 of the 3). Cost sharing or proposals augmenting ongoing partnership efforts are very strongly encouraged.

Background: The central focus of the Partnership Program is an integrated and sustained ocean observation system achieved by a federation of many elements to support a wide range of users. The following five Topic Areas form the basis of the NOPP Investment Portfolio:

- Operational/Routine Observations (including pilots, testbeds, etc.),
- Research "Observatories" (long-term experiments and data series, etc.),
- Observational Technique Development (sensors and platforms),
- "Commons" for Ocean Information ("hubs" and "nodes", etc.),
- Outreach/Education.

These investment areas are more fully described at www.nopp.org/NOPPfunds.html/ where examples of ongoing NOPP efforts are also listed by these areas. The NOPP website will contain the most recent information. Not all NOPP solicitations will seek proposals in all areas. This announcement seeks only proposals for new projects under Topics A and C and renewal proposals of existing NOPP projects under topic areas C and E.

Topic A. Operational/Routine Observations

A (1) Economic Benefit-Cost Studies of Regional Coastal Ocean Observing Systems

Partnership proposals are sought to conduct economic analyses to identify and quantify the expected economic benefits of sustained coastal ocean observing systems in each major US coastal region (including the Great Lakes). Economic benefits should be identified, articulated, and quantified to the extent possible for each major user group to include: a) private sector activities such as energy development and transportation, commercial fishing, and commercial shipping; b) non-market activities such as coastal recreation, boating, and fishing; and c) public sector activities such as search and rescue and environmental protection, e.g. oil spill response. The analysis should be capable of adding up benefits across the sectors to arrive at total systems benefits, which should then be compared with the estimated

costs of the system in terms of standard benefit-cost analytic techniques such as net present values, internal rates of return, and cost/benefit ratios.

It is assumed that primarily extant information on user groups, sectors, and costs will be used for these studies, given the time and cost constraints. New information (e.g., surveys) is constructive, but will likely be at a minimum.

A major objective of this topic area is to produce initial estimates of economic benefits and costs that are comparable across regions and sectors using generally accepted tools of economic analysis. For this reason, it is anticipated that NOAA's Chief Economist, who has organized similar studies, will provide coordination and oversight for the individual regional studies.

NOPP envisions support for up to 8 individual economic studies not to exceed a total of \$400,000 over two years; total funding for each selected project will be approximately \$50,000.

A (2) Surface Vector Winds (SVW)

There is a maturing research capability to observe and utilize satellite-derived SVW over the oceans using various algorithms and models. NOPP would like to demonstrate potential benefits of having comparable capabilities within the operational ocean and marine weather forecasting communities to improve existing or generate new products. The goal is to help the operational community get ready to use SVW data and products from missions such as QuikSCAT, Wind Sat, SeaWinds/ADEOS-II, ASCAT/METOP, and CMIS/NPOESS. This is to be accomplished via substantive partnering between the research and operational communities, helping ensure that the operational community is aware of the capabilities and limitations of, and has the tools to use, various SVW data and products. The specific objective is to demonstrate the utility of satellite-derived SVW in an operational setting, providing quantitative measures of their impact wherever possible.

A (3) Sea Surface Temperature (SST)

While operational satellite-derived SST products have been produced for over two decades, there have been advances in research capabilities to observe and utilize satellite-derived and in-situ SST. It is now time to design and demonstrate a prototype system to produce on an operational basis both in-situ skin and bulk SST products, for use in conjunction with missions such as AVHRR/POES, TMI/TRMM, AMSR/AQUA and ADEOS-II, and VIIRS/CMIS/NPOESS. The demonstration should collect both skin and bulk SSTs from a limited number of volunteer observing ships, where personnel are available to check instruments while the ships span a broad range of latitudes. With NPOESS requiring skin and bulk SST data and products, a successful demonstration of the prototype system will enable improvements in the calibration of satellite-derived observations of skin SST, and especially in the estimation of heat flux across the sea surface. This demonstration is to be accomplished via substantive partnering between the research and operational communities, helping ensure that the operational community is aware of the capabilities and limitations of, and has the tools to use, various potential improvements to SST data and products. If successfully demonstrated, this prototype system could then be implemented globally on a routine and continuing basis.

Topic A2 and A3 Summary: While some efforts have begun to explore new and improved operational products, NOPP wishes to accelerate development and operational demonstration of data products and operational services using these data sources. Successful proposals must have substantive partnerships involving both research and operational entities. Each project should address the development of new self-consistent data and products and show why they represent improvements to the status quo.

In Topics A2 and A3, approximately \$3.0M will be available over three years to support two selected projects; each project will be in the range of \$500K per year for three years.

Topic B. Research "Observatories"

No proposals are being solicited in this area at this time.

Topic C. Observational Technique Development

Partnership efforts are sought here to develop and/or demonstrate new ocean observational capabilities to establish the means for continuous, high-resolution measurements of oceanic processes. For this solicitation the emphasis is on further biological and chemical sensor developments for autonomous and unattended moving and fixed observational platforms (e.g., drifters, floats, gliders, AUVs and moorings).

NOPP wishes to continue the technical development of biological and chemical sensors started in the FY99 BAA and their integration on a variety of autonomous devices and observing instruments for long-term (weeks to months) deployments, so that the scientific and operational data returned from the developing ocean observing network can be continuously improved.

Collaborative proposals are sought for development and application of new sampling, analytical, and interpretive techniques to improve the characterization of distributions, mechanisms, and rates of processes involving chemical and biological variables together with physical variables in the ocean. The challenge is to develop rapid analytical techniques and "smart" sampling tools based on real-time measurements. Fundamental progress will require coordinated efforts involving:

- improvements in sampling and measurement strategies on process-relevant time and space scales,
- implementation and/or development of new analytical methodologies, and
- processing/storage/transmittal that closely link observations to models, sufficiently to develop a predictive capability.

Such efforts should embrace networking and broad accessibility to all derived data in near or real time.

Autonomous and/or long-term and/or distributed approaches that provide new observational capabilities for the ocean community are particularly encouraged.

The emphasis should be placed on one or more of the following:

novel approaches and concepts for measuring a specific biological and/or chemical parameter coherently in 4-D;

unattended observations which can be extended over time periods from various platforms (e.g., for independent operation Autonomous Underwater Vehicles (AUV's), drifters, gliders, and floats) or on moored platforms, all with real-time telemetry;

providing a significant reduction in instrument power requirements, weight and volume without reducing fidelity or resolution as compared to current state-of-the-art devices; and

developing the next generation of low cost biological and/or chemical instrumentation for use by the ocean research community.

Proposals should clearly specify:

- what capabilities the new technology will provide;
- how it improves upon existing technology and sampling methodology;
- why it is important and relevant to the needs of the oceanographic community; and
- the current status of the technology (whether a prototype has been tested or when one will become available to users as a result of funding provided by NOPP).

New proposals may request up to five years of support for instrument development, testing and validation. Renewal of previous NOPP awards in this topic may request up to two additional years for continued testing and validation. Approximately \$10M is available to support 2 to 5 new projects in the range of \$500K to \$1M per year for up to 5 years.

Topic D. "Commons" for Ocean Information

No proposals are being solicited for this topic at this time. However, a special solicitation for this topic may be issued later this year.

Topic E. Outreach/Education

Only renewal proposals are being solicited (see below). No new project proposals are being solicited under this topic area at this time.

Renewals. Topics C and E

Currently funded NOPP partnership efforts under Topic C can seek additional funding for 2-5 renewal projects in the range of \$200K to \$400K per year each for up to 2 years.

Currently funded NOPP partnership efforts under Topic E can seek additional funding for one year to "wrap-up" existing efforts and/or to begin transition to other efforts, where appropriate. Funding up to \$100,000 per year each will be available for 1 year for these purposes.

Review of these efforts will follow the guidelines outlined below, with the additional criterion of accomplishments achieved to date. Proposals must clearly state on their cover sheet that this proposal is a Renewal.

General Instructions and Information

Separate proposals must be submitted for each topic or subtopic area. It is anticipated that all awards to non-governmental participants resulting from this announcement will be grants. Any NORLC member may fund research in response to this solicitation.

Messages of Intention to Propose

All potential offerors are requested to send an electronic message of intention to propose to NOPPBAA@onr.navy.mil as soon as possible, but not later than March 12, 2002, to permit the peer review process to be planned in advance. Such messages should list the intended title, probable partners, and Principal Investigator(s) for the project

Proposal Format: The format for proposals can be found at [<NOPPBAA01.html>](http://www.nopp.org)

Cover Page: Each proposal must include a completed Research Proposal Cover Page in the format available on the NOPP Website. This formatted Cover Page must be the first page of each proposal and will not count against page limitations.

Due Date: Proposals for new efforts must be received not later than 4:00 pm EDT, 11 April 2002. Renewal proposals may be submitted up to one year after the date of publication of this announcement; however the availability of funds may be reduced for renewal proposals received after 4:00 pm EDT, 11 April 2002.

Electronic submission, in pdf format only, is required. Offerors should submit their proposal as a single pdf file. Electronic proposals in other than pdf format will not be accepted. Uncertainties and delays in mail systems and in moving paper copies around for reviews are motivating this new NOPP submission requirement. Questions about this new policy should be directed to NOPPBAA@onr.navy.mil.

Electronic proposals should be submitted either at www.onr.navy.mil/02/baa/ or on a single zip disk or CD-ROM if FTP submission is not desired. Any electronic proposals submitted by U.S. Postal Service or private delivery service should be sent to the address below.:

NOPP BAA/ONR 32
Room 407-8
Office of Naval Research
800 N. Quincy Street Arlington,
VA 22217-5660

Proposals received after the dates and times outlined in this announcement will not be considered.

Annual Reports

All funded NOPP efforts must submit an Annual Report for use in the mandatory annual Spring NOPP Report to Congress. The NOPP Program Office will call for these each winter.

Funding estimates for any ship-time must be specifically included in the proposal, and the budget should include full ship costs and clearly specify the size and type of vessels proposed for use. Ships of opportunity are encouraged. Proposers should include shiptime requests on either the former NSF Form 831 (Shiptime Request Form) or preferably the University / National Oceanographic Laboratory System (UNOLS) on-line request form available at: <http://www.gso.uri.edu/unols/ship/shiptime.html>.

No additional request for proposals (RFP), solicitation, or other announcement of this opportunity will be made.

Historically Black Colleges and Universities and Minority Institutions, as determined by the Secretary of Education to meet requirements of 34 CFR Section 608.2 and 10 U.S.C. Paragraph 2323(a)(1)(C), are particularly encouraged to participate.

Evaluations of the proposals will be performed using the following selection criteria:

- Relevance of the proposed research to NOPP objectives,
- Overall scientific and technical merits of the proposal,
- Level of support of critical research objectives or operational goals such as data accessibility, education and communication,
- Quality of proposed partnerships including the degree of broad participation within the oceanographic community and demonstration of significant partnering among at least two of the following parties: academia, industry, or government and extent resources are shared among partners,
- NOPP project accomplishments to date (applies to renewal projects only),
- The offeror's capabilities, related experience, and facilities or unique combinations of these that are critical to the proposal objectives,

- The partnership member's long-term commitment to the proposed objectives,
- The qualifications and experience of the proposed principal investigator and key personnel,
- The degree and quality of proposed cost-sharing.

All proposals will be subject to peer review, which will include non-governmental reviewers. All reviewers will adhere to confidentiality and conflict of interest standards. A synopsis of the NOPP review process can be found at <http://www.nopp.org>.

The final distribution of awards will depend on quality of proposals, programmatic balance, NOPP priorities and availability of funds.

Questions regarding contractual matters relating to this BAA should be directed to Brian Glance via mail Office of Naval Research, ONR 252 Brian Glance, Ballston Tower One, 800 N. Quincy St., Arlington, VA 22217-5660, via telephone at (703)696-2596 or via e-mail to glanceb@onr.navy.mil. Technical questions may be submitted by e-mail to NOPPBAA@ONR.NAVY.MIL or by fax to "NOPP BAA" (703) 696-2007 if necessary.

This notice constitutes a BAA as contemplated in FAR 6.102 (d)(2)(i). A formal RFP or other solicitation regarding this announcement will not be issued. Request for the same will be disregarded. ONR will not issue paper copies of this announcement. The Government reserves the right to select or award all, some or none of the proposals received in response to this announcement. All responsible sources may submit a proposal, which shall be considered under these guidelines by the Office of Naval Research.

5.3 2003 RFP FOR THE GLOBAL OCEAN DATA ASSIMILATION EXPERIMENT (GODAE)

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[Docket No.021202295–2295–01]

Global Ocean Data Assimilation Experiment (GODAE)

AGENCY: National Oceanic and Atmospheric Administration, Department of Commerce.

ACTION: Notice of request for proposals.

SUMMARY: The purpose of this notice is to advise the public that the National Oceanic and Atmospheric Administration (NOAA), on behalf of the National Oceanographic Partnership Program (NOPP), is entertaining preliminary proposals (Letters of Intent) and subsequently full proposals for implementing the initial, preoperational U.S. contribution(s) to the Global Ocean Data Assimilation Experiment. These efforts are a Pilot Project under Ocean.US, the National Office for Integrated and Sustained Ocean Observations, intended to lead to sustained operational efforts supported by U.S. agencies such as NOAA and the U.S. Navy.

The NOPP was established by 10 U.S.C. 7902 et seq. to (1) promote the national goals of assuring national security, advancing economic development, protecting quality of life, and strengthening science education and communication through improved knowledge of the ocean; and (2) coordinate and strengthen oceanographic efforts in support of those goals by identifying and carrying out partnerships among Federal agencies, academia, industry, and other members of the oceanographic scientific community in the areas of data, resources, education, and communication.

In FY 2003, NOPP intends to begin a program to demonstrate the value of near-real-time, ocean data assimilation. Contingent on the availability of appropriated funds, this program is expected to continue for three to five years. The level of funding available each year will be dependent on appropriations. It is expected that approximately \$1,500,000 will be available for the first year of the project, approximately \$2,500,000 for the second year, and up to \$4,500,000 for the third year. It is expected that the level of funding for the third year will continue for two additional years, depending on progress. Proposals should be written as three-year efforts with options to continue in years four and five should progress be satisfactory.

DATES: January 10, 2003, 5 pm (EST)—Letter of Intent in electronic, facsimile, or hard copy form due. Letters of Intent are used for assessment purposes only and are not a requirement for proposal submission.

February 24, 2003, 5 pm (EST)—Full proposal in electronic or hard copy form due. The proposal must clearly delineate each partner's efforts and the associated request(s) for NOPP funds as well as any cost-sharing that may be offered. (Cost- or resource-sharing is not required in any response to this announcement.) The same proposal will implement funding of all partners in the proposed effort, if selected, thus, separate budgets within the single proposal will be required if more than one funding action is needed. Unsuccessful applications will be destroyed.

June 1, 2003 (approximate)—Funds awarded to selected recipients. Program begins.

ADDRESSES: Because of potential delays and/or damage in mailing or shipment of hard copy submissions, electronic submissions of Letters of Intent (LOI) and Proposals are strongly encouraged. Electronic submissions must be in PDF format. Electronic submissions in other than PDF format will not be accepted. Electronic submissions must be directed to the National Oceanographic Partnership Program at <http://www.onr.navy.mil/sci-tech/ocean/GODAE-NOAA.htm>; ATTN: Stephen R. Piotrowicz. Letters of Intent submitted by facsimile must be directed to Ocean.US, ATTN: Stephen R. Piotrowicz at 703-588-0872. Letters of Intent and Proposals submitted in hard copy form must be submitted to: Ocean.US, 2300 Clarendon Blvd., Suite 1350, Arlington, VA 22201; ATTN: Dr. Stephen R. Piotrowicz. Proposals submitted in hard copy form should contain one original plus two copies of the full proposal. If color and/or grayscale graphics are included in the proposal, and offerer feels that color or grayscale graphics would be necessary for the review process, the offerer may submit twelve additional copies of the graphics.

FOR FURTHER INFORMATION CONTACT: Dr. Stephen R. Piotrowicz, telephone: (703) 588-0850; facsimile: (703) 588-0872; internet: Steve.Piotrowicz@noaa.gov.

Supplementary Information:

I. Program Authority

Authority: 49 U.S.C. 44720 (b); 33 U.S.C. 883d; 15 U.S.C. 2904; 15 U.S.C. 2934, (CFDA No. 11.431)—Climate and Atmospheric Research.

II. Program Description

Background - The Global Ocean Data Assimilation Experiment (GODAE) is a one-time pilot project to demonstrate the feasibility and practicality of near real-time global ocean data assimilation and numerical modeling for: (a) Short range open ocean forecasts; (b) boundary conditions to extend predictability of coastal regimes; (c) initialize climate forecast models; and (d) research during the period 2003 to 2007. GODAE has been in planning for at least five years.

Within the international community this has culminated in the preparation of both a Strategic Plan and an Implementation Plan (<http://www.bom.gov.au/GODAE/IP/Plan.htm>). NOPP has provided substantial funding for a number of U.S. GODAE-preparatory and GODAE-related activities, which have established a foundation upon which we now wish to build as GODAE moves into its demonstration phase as a Pilot Project under Ocean.US. Elements of the international community are in the process of organizing GODAE. Demonstrating the utility of near-realtime data assimilation in an operational setting would provide critical feedback needed to justify the continuance of basin-scale ocean observing and prediction/estimation systems over the long term.

Funding Availability - Actual funding levels will depend upon the final budget appropriations. This Program Announcement is for a program to be conducted over a three (nominal) to five (with options) year period, by investigators both inside and outside the Federal Government. It is expected, though not certain, that two or more programs involving multiple investigators will be funded, with possible coalescence or down-selection for the Option years 4 and 5. In accordance with the NOPP, team efforts among academia, industry, and government participants are very strongly encouraged; the degree of intersector teaming is a selection criteria. For Federal Government investigators, funding will be provided through intra- or interagency transfers, as appropriate.

The funding instrument for extramural include, but are not limited to, proposals for collaboration between NOAA or NOAA scientists and a recipient scientist or technician and/or contemplation by NOAA of detailing Federal personnel to work on proposed projects. NOAA will make decisions regarding the use of a cooperative agreement on a case-by-case basis.

III. Eligibility

Extramural eligibility is not limited. Eligible applicants include institutions of higher education, other non-profits, commercial organizations, international organizations, state, local and Indian tribal governments. Applications from non-Federal and Federal applicants will be competed against each other. Please Note: Before non-NOAA Federal applicants may be funded, they must demonstrate that they have legal authority to receive funds from another Federal agency in excess of their appropriation. The only exception to this is governmental research facilities for awards issued under the authority of 49 U.S.C. 44720. Because this announcement is not proposing to procure goods or services from applicants, the Economy Act (31 U.S.C. 1535) is not an appropriate legal basis.

IV. Evaluation Criteria

Evaluations of the proposals will use the following selection criteria:

1. Relevance of the proposed program to NOPP objectives, including (30%): Support of critical research objectives or operational goals that meet NOPP and participating federal agency requirements, Broad participation within the oceanographic community, Partners with a long-term commitment to the proposed objectives, Resources are shared among partners, and Active involvement of one or more operational centers.
2. Overall technical merits of the proposal (30%), including: Demonstration of the utility of nearreal-time data assimilation in operational settings; Coordination and/or collaboration with existing operationally oriented efforts; Feedback mechanisms between assimilation efforts and data set providers; Collaborative activities with international efforts providing mutual benefits to both.
3. The offeror's capabilities, related experience, and facilities or unique combinations of these that are critical to the program's objectives (10%).
4. The qualifications and experience of the proposed principal investigator(s) and key personnel (10%).
5. The degree of significant partnering among at least two of the following parties, academia, industry or government (10%).
6. Realism and duration of the proposed costs (10%). The proposed program shall produce substantive results in no more than three years to allow review and decisions on any proposed options for extension to years four and five. Nonproductive programs will be considered for termination at the end of three years, regardless of any options.

V. Selection Procedures

The review process will be conducted by the NOPP Program Office on behalf of the NOPP agencies. A description of the NOPP Proposal Review Process can be found at: <http://www.nopp.org/Dev2Go.web?id=236688&rnd=31591>. All proposals, including those submitted by NOAA employees, will be evaluated similarly.

The process uses peer reviews solicited by mail and/or a panel. Federal conflict of interest rules are followed. The individuals who provide peer review are scientists drawn from academic, government, and industrial/commercial communities. Mail reviews require a scoring in accordance with the criteria presented in Section IV, Evaluation Criteria, as well as a narrative assessment.

If a panel is convened along with soliciting mail reviews, it will take the results of the mail reviews and rate the proposals into three Tiers (1—Strong Proposal, fundable with no significant issues; 2— Strong Proposal, fundable with issues to be resolved; 3—Not Recommended). The ratings will be determined by

a vote of the Panel on each proposal individually with the Tier assigned according to the highest number of votes received. In the event of a tie between two or three tiers, the proposal will be assigned to the highest rated Tier of the Tiers that tied for the highest number of votes.

If only a panel is convened, it will both score the proposals numerically in accordance with the criteria in Section IV and rate the proposals into tiers. No consensus advice will be given by the Panel (unless the panel is composed entirely of Federal employees.). The recommendations and evaluations of the panel will be considered by the NOPP Interagency Working Group along with the following program policy factors:

- Availability of funding;
- Duplication of on-going Federal support;
- Duplication with other applications in the solicitation;
- Geographic diversity;
- Diversity among the types of institutions receiving awards;
- Collaboration among multiple jurisdictions; and
- Subject area diversity within the competition.

The recommendations of the participating funding agencies will be forwarded to the National Ocean Research Leadership Council for final selection(s) based on the program policy factors given above. Any proposal within Tier One or Tier Two may be selected for award. The Program Manager(s) in the agencies will also recommend the total duration of funding and the amount of funding for each partner in the proposal. Unsatisfactory performance by a recipient under prior Federal awards may result in an application not being considered for funding.

VI. Instruction for Application - What To Submit

Letter of Intent (LOI) - To prevent the expenditure of effort that may not be successful, it is in the best interest of applicants to submit letters of intent, however, it is not a requirement. Letters of Intent (LOI) must be sent by electronic mail. The following information should be included:

(1) The LOI should clearly identify the program area being addressed by starting the project title with “U.S. GODAE:” Principal Investigators and collaborators should be identified by affiliation and contact information. The total amount of Federal funds being requested should be listed for each budget year for each collaborator’s institution.

(2) A concise (2-page limit) description of the program including a brief summary of the work to be completed, methodology to be used, approximate costs of the major elements (salaries and benefits, direct costs, and travel). Evaluation will be by NOPP agency program management. Projects deemed suitable during Letters of Intent (LOI) review will be encouraged within 15 days to submit full proposals; projects may also be discouraged from submitting full proposals, but investigators may still do so if they wish.

(3) Resumes (1-page limit each) of the Principal Investigators.

Full Proposal Guidelines - Each full proposal must include the first seven items listed below; the standard forms included as Item 8 will only be required for proposal(s) selected for funding. All pages should be single- or double-spaced, typewritten in at least a 10-point font, and printed on metric A4 (210 mm x 297 mm) or 8 1/2” x 11” paper. Brevity will assist reviewers and program staff in dealing effectively with proposals, therefore, the Program Description may not exceed 15 pages. Tables and visual materials, including figures, charts, graphs, maps, photographs and other pictorial presentations are included in the 15- page limitation; literature citations and letters of support, if any, are not included in the 15-page

limitation. Conformance to the 15-page limitation will be strictly enforced. All information needed for review of the proposal should be included in the main text; no appendices, other than support letters, if any, are permitted. Failure to adhere to the above limitations will result in the proposal being rejected without review.

- (1) Signed Title Page: The title page should be signed by the Principal Investigator(s) and the institutional representative and should clearly identify program by starting the title “U.S. GODAE:” The Principal Investigator and institutional representative should be identified by full name, title, organization, telephone number, and address. The total amount of Federal funds being requested should be listed for each year of the program; the total should include all collaborator’s budgets on projects involving multiple institutions, even if one of the collaborators is a Federal institution.
- (2) Abstract: An abstract must be included and should contain an introduction of the problem, rationale and a brief summary of work to be completed. The abstract should appear on a separate page, headed with the proposal title, institution(s) investigator(s), total proposed cost and budget period.
- (3) Program Description/Work Statement (15-page limit): The Program Description should include identification of the problem, objectives of the work, relevance to the operational prediction mission, proposed implementation strategy, and proposed methodology. The following elements should be described in detail: (a) Approach: The Project should demonstrate the implications of realtime ocean data assimilation into operational analysis and forecast models, or into analysis and forecast systems that are running in an operational mode. It should facilitate the process of acceptance of such assimilation by one or more operational entities, entraining the operational entity(ies) working on a 24/7 basis. Approaches that propose work independent of operational activities, such that a “hand-off” is proposed at the end of the project will not be deemed responsive to this call. (b) Data Management: It should illustrate how real-time (within 24 hour) delivery of products will be achieved, although longer-delivery times (with, for example, more quality control) may be acceptable in addition but not instead, for some products.
- (4) Budget and Budget Justification: There should be a separate budget for each year of the project as well as a cumulative annual budget for the entire project. Subcontracts should have a separate budget page. Applicants should provide justification for all budget items in sufficient detail to enable the reviewers to evaluate the appropriateness of the funding requested.
- (5) Current and Pending Support: Information on the number of personmonths per year devoted to this project and ongoing projects regardless source of support (Federal, State, or local government agencies, private foundations, industrial or other commercial organizations) by the Principal Investigator and other senior personnel must be listed. Similar information must be provided for all proposals already submitted or submitted concurrently to other possible sponsors, including those within NOAA.
- (6) Vitae (2 pages maximum per investigator): Abbreviated curriculum vitae are sought with each proposal. Reference lists should be limited to all publications in the last three years with up to five other relevant papers.
- (7) Results from prior research: The results of related projects supported by NOAA and other agencies should be described, including their relation to the currently proposed work. Reference to each prior research award should include the title, agency, award number, Principal Investigators, and total award. The section should be a brief summary and should not exceed two pages total.

- (8) Standard Application Forms: For proposal(s) selected for funding, the following forms must also be submitted: Standard Forms 424, Application for Federal Assistance, and 424B, Assurances-Non-Construction Programs, (Rev 4-88). Please note that both the Principal Investigator and an administrative contact should be identified in Section 5 of the SF424. For Section 10, for proposals selected for funding by NOAA, applicants should enter “11.431” for the CFDA Number and “Climate and Atmospheric Research” for the title. The form must contain the original signature(s) of an authorized representative of the applying institution(s).

DOC/NOAA is strongly committed to broadening the participation of Historically Black Colleges and Universities (HBCU), Hispanic Serving Institutions (HIS), and Tribal Colleges and Universities (TCU) in its educational and research programs. The DOC/NOAA vision, mission, and goals are to achieve full participation by Minority Serving Institutions (MSI) in order to advance the development of human potential, to strengthen the nation’s capacity to provide high-quality education, and to increase opportunities for MSIs to participate in and benefit from Federal Financial Assistance programs. DOC/NOAA encourages all applicants to include meaningful participation of MSIs. Institutions eligible to be considered MSIs are listed at the following Internet Web site: <http://www.ed.gov/offices/OCR/99minin.html>.

The Department of Commerce Pre- Award Notification of Requirements for Grants and Cooperative Agreements contained in the Federal Register notice of October 1, 2001 (66 FR 49917), as amended by the Federal Register notice published on October 30, 2002 (67 FR 66109), is applicable to this solicitation. Applications under this program are not subject to Executive Order (EO) 12372, “Intergovernmental Review of Federal Programs. This notice has been determined to be not significant for purposes of E.O. 12866. It has been determined that this notice does not contain policies with Federalism implications as that term is defined in EO 13132. Notice and comment are not required under 5 U.S.C. 553(a)(2), or any other law, for notices relating to public property, loans, grants, benefits or contracts. Because notice and comment are not required, a Regulatory Flexibility Analysis, 5 U.S.C. 601 et seq., is not required and has not been prepared for this notice.

This documents contains collection of information requirements subject to the Paperwork Reduction Act (PRA). The use of Standard Forms 424 and 424B have been approved by OMB under the respective control numbers 0348-0043 and 0348-0040.

Notwithstanding any other provision of law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with a collection of information subject to the Paperwork Reduction Act unless that collection displays a currently valid OMB Control Number. Louisa Koch, Acting Assistant Administrator, Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration. [FR Doc. 02-31195 Filed 12-10-02; 8:45 am] BILLING CODE 3510-KD-P

Appendix 6. National Oceanographic Partnership Program FY 2002 Funded Project Summaries

TOPIC A. OPERATIONAL / ROUTINE OBSERVATIONS

Coordinated Regional Benefit Studies of Coastal Ocean Observing Systems

Lead PI: Dr. Hauke L. Kite-Powell

The Marine Policy Center at WHOI, working with academic and private sector economists in major US coastal regions, is conducting a set of coordinated regional studies to assess the expected economic benefits of sustained, improved coastal ocean observing systems. To ensure that results from regional studies can be compared and aggregated to national levels, these studies will be based on a common set of assumptions and economic methodologies. The study will first produce for each region an “inventory” ocean observation user sectors, including information about the physical and economic scale of their activities, how products from improved ocean observation might be incorporated into their decisions, and a rough estimate of the potential value of improved decisions. Once the inventories are complete, investigators will select sectors with significant expected benefits for more detailed analysis. The final product will be a set of internally consistent inventories that together cover the major uses of ocean observing information for the nation as a whole, plus a set of region-and sector-specific studies that quantify likely benefits and costs in some detail and permit more reliable estimates of quantitative benefits for ocean observation at the regional and national scales.

Number of years: 2

Total Proposed Budget: \$400,000

Table of Partners:

Partner	Sector	Role and Task
Woods Hole Oceanographic Institution	Educational	Project coordination and benefit studies in northeast, mid-Atlantic, and Alaska
University of North Carolina	Educational	Benefit studies in southeastern region
University of South Florida	Educational	Benefit studies in Florida
Louisiana State University	Educational	Benefit studies in Gulf of Mexico region
University of Wyoming	Educational	Benefit studies in California
K. Wellman	Industrial	Benefit studies in Pacific Northwest region
Delta Research Inc.	Industrial	Benefit studies in Great Lakes region
University of Southern Maine	Educational	Project coordination and benefit studies in northeast and mid-Atlantic regions

Operational Utilization of High Resolution Ocean Surface Wind Vectors (25km or better) in Marine Forecasting and High Resolution Regional NWP Models.

Lead PI: Dr. Paul S. Chang

This project seeks to further exploit currently and soon to be available satellite ocean surface vector wind data in the operational weather forecasting environment in order to build upon an ongoing effort to quantify the impacts of QuikSCAT ocean vector wind data in the operational short-term warnings and forecasts issued by the NWS Marine Prediction Center (MPC). This effort aims to operationally generate and distribute a gridded wind vector analysis and forecast product out of the MPC to end user participants (US Coast Guard and OCENS Inc.) who will provide feedback on the product impacts and utility. The project will also assimilate the highest resolution satellite ocean vector wind data available into the NWS Environmental Modeling Center's regional ETA model. In addition to evaluating the data impacts on the ETA forecasting skill, these forecasts will be provided operationally to MPC to be used as guidance in generating the gridded wind field products for distribution, and will also seek to investigate improvements to the currently available standard wind vector product that will yield positive impacts in its operational utilization. In particular, ambiguity removal processing and quality flagging improvements in adverse weather conditions will be studied along with the potential of retrieving higher resolution (< 25km) wind vector products. Additionally, the launch of WindSat in January 2003 will represent the first polarimetric radiometer in space designed for retrieval of the ocean surface wind vector. After WindSat's calibration/validation period, the ocean vector wind data retrieved from it will be compared and integrated with the scatterometer wind vector products. Attempts will also be made to improve the spatial resolution of WindSat products where it is feasible.

Number of years: 3

Total Proposed Budget: \$1,498,380

Table of Partners:

Partner	Sector	Role and Task
NOAA-NESDIS-Office of Research and Applications	Governmental	Project coordination, development, validation, and production of products
NOAA-NWS-NCEP-Marine Prediction Center	Governmental	Development, generation and operational distribution of products
NOAA-NWS-NCEP-Environmental Prediction Center	Governmental	Assimilation studies to quantify the impacts of ocean vector wind data in the ETA NWP model
Brigham Young University	Educational	Development of independent ambiguity removal procedures and wind products
Naval Research Laboratory	Governmental	Address issues from forecaster feedback and investigate higher resolution WindSat products
OCENS	Industrial	Development of user interface, distribution methodology and feedback collection

TOPIC C. OBSERVATIONAL TECHNIQUE DEVELOPMENT

Developing Gene-Based Remote Detection

Lead PI: Dr. Kelly Goodwin

This project aims to develop remote, gene-based detection for species-specific identification of organisms. Remote, *in situ* sensing is a valuable oceanographic tool that can be used to monitor coastal water quality and understand basic ecological processes, such as plankton population dynamics, organism monitoring, and coral reef health. However, the utility of remote sensing has been constrained by the need for species-specific information, which has continued to require shipboard collection and intensive manual processing of samples. This project aims to apply advances in biotechnology to address the critical need for species-specific remote sensing. This funding request covers Phase I of the study, which focuses on two components critical to biosensor development -- remote extraction of DNA and direct electrical DNA detection without using PCR amplification.

Number of Years: 2

Total Proposed Budget: \$467,000

Table of Partners:

Partner	Sector	Roles and Tasks
Cooperative Institute of Marine and Atmospheric Studies	Governmental/Educational	Project coordinator, development of remote extraction methods, data analysis and synthesis
NOAA-AOML	Governmental	Supervise protocol development to ensure integration with existing sensor hardware
University of Miami	Educational	Supervise hybridization development and development of electrochemical detection protocols

Multi-disciplinary Ocean Sensors for Environmental Analyses and Networks (MOSEAN)

Lead PI: Dr. Tommy D. Dickey

The Multi-disciplinary Ocean Sensors for Environmental Analyses and Networks (MOSEAN) project addresses the need for increased observations that are essential for solving a set of diverse interdisciplinary problems of societal importance. These include: biogeochemical cycling, climate change effects, ocean pollution, harmful algal blooms, ocean ecology, and underwater visibility. The new MOSEAN interdisciplinary sensor suites will be capable of measuring key chemical and biological/bio-optical variables to complement physical data suites on time scales as short as minutes and space scales down to a meter. The sensors will be designed for interfacing to a variety of autonomous sampling platforms and for real-time or near real-time data telemetry. The first phase of the effort will focus on development and testing of proto-type sensors utilizing four testbed moorings: nearshore (Santa Barbara Channel), coastal (Monterey Bay), open ocean Atlantic (off Bermuda), and open ocean Pacific (off Hawaii). The second phase will also include interfacing and testing of sensors that will be integrated with autonomous underwater vehicles (AUVs) and other autonomous sampling platforms. The project will involve broad participation of the oceanographic community. It will include multi-platform, multi-disciplinary, real-time sampling at four sites and initiate efforts toward synthesis and predictive modeling of 4-dimensional interdisciplinary data sets.

Number of Years: 5

Total Proposed Budget: \$2,500,000

Table of Partners:

Partners	Sector	Role and Task
University of California, Santa Barbara	Educational	Project coordination, interdisciplinary system integration of bio-optical, chemical, and physical sensors and data telemetry
NOAA-AOML	Governmental	Geochemical measurements, verification and relation to global climate change
Bermuda Biological Station for Research	NGO	Geochemical measurements, groundtruthing and sensors
Monterey Bay Aquarium Research Institute	NGO	Interdisciplinary systems including chemical, bio-optical, and physical sensors, telemetry systems
NOAA-PMEL	Governmental	Geochemical measurements, telemetry, data dissemination
University of Hawaii	Educational	Geochemical measurements, groundtruthing, and sensors, HALE-ALOHA mooring coord.
University of South Florida	Educational	Sensors for in-situ determination of pH, NO ₂ , DIC, and iron
WETLabs	Industrial	Bio-optical sensors and nutrient analyzers

The Environmental Sample Processor (ESP): A Device for Detecting Microorganisms In Situ Using Molecular Probe Technology

Lead PI: Dr. Christopher A. Scholin

Molecular probes are extremely useful tools for identifying water borne microorganisms and the substances they produce, even when those targets are very dilute and embedded in a taxonomically complex and organic-rich matrix. Application of such technology outside of a laboratory poses many technological challenges, particularly if unattended, real-time synoptic analysis of multiple locations for extended periods of time is desired. The Environmental Sample Processor (ESP) is a novel instrument developed in an effort to overcome these challenges. The ESP collects discrete water samples, concentrates microorganisms and automates application of DNA (or other) molecular probes to enable identification and quantification of particular species captured. The instrument transmits results of DNA probe array-based assays in real-time to a shore-based location for processing, interpretation and dissemination. In addition, the ESP archives discrete samples for nucleic acid, microscopic and toxin analyses for verifying real-time data from the probe arrays as well as facilitating discovery-based analyses in the laboratory. This proposal seeks funds to enhance this on-going instrument development program by constructing and deploying a suite of second generation, internet-accessible ESPs, and by developing real-time toxin detection capabilities. Identification of specific nuisance, harmful or toxic algal species that pose widespread economic concerns and/or are known to negatively impact the health of humans and wildlife is emphasized. Field tests of the ESP will take place in Monterey Bay, California.

Number of years: 3

Total Proposed Budget: \$1,590,000

Table of Partners:

Partner	Sector	Roles and Tasks
Monterey Bay Aquarium Research Institute	NGO	DNA probe array development, field studies of HAB species, and ESP engineering
NOAA-NOS	Governmental	Development of toxin detection chemistries, field studies of HAB species
Ship Time		ESP deployment and field testing

Accelerating Electronic Tag Development to Track Free-Ranging Marine Animals at Sea

Lead PIs: Dr. Barbara Block and Dr. Daniel Costa

The objective of this proposal is to complete the development and testing of archival and satellite tags for the Tagging of Pacific Pelagics (TOPP) pilot program of the Census of Marine Life (CoML). TOPP will use electronic tags to describe patterns of movement and behavior of marine vertebrates and large squid in the North Pacific. Electronic Tags will provide this program with the tools necessary to address fundamental questions in biological oceanography concerning the distribution, behavior and critical habitats of pelagic organisms. Tag-bearing animals have been used as autonomous ocean profilers to provide oceanographic data in key ocean regions. When the biological and physical data are merged a new understanding of the relationship between the movements and behaviors of marine organisms and oceanographic processes is apparent. The new animal-collected oceanic data will complement more traditional methodologies for assimilation into oceanographic models. This proposal is specifically aimed at completing the testing of existing tags as well as developing new gas and sensor technologies. This grant will provide funds to beta test two novel electronic tags, a CTD tag that will improve oceanographic sampling and GPS archival data logger. Funding will also go to improve the precision of geolocations and temperature measurements and thus define data sets with finer temporal and spatial resolution as well as accuracy. The temporal and spatial data generated by this project will provide an “organism-eye” view and detailed understanding of how marine animals from several trophic levels use distinct oceanic regions in the eastern Pacific.

Number of Years: 3

Total Proposed Budget: \$2,997,000

Table of Partners:

Partner	Sector	Roles and Tasks
Stanford University	Educational	Project coordinator, oversee development and field testing of tags
NOAA-NMFS	Governmental	Testing of PAT versus SPOT tags on sharks
University of California Santa Cruz	Educational	Oversee development and field test of tags on elephant seals
Oregon State University	Educational	Testing of PAT tag on blue whales
University of St. Andrews	Educational	Development of GPS and CTD tags
Monterey Bay Aquarium	NGO	Ship time support for tuna tagging and captive collection
Wildtrack Telemetry Systems	Industrial	Development of GPS tag
Wildlife Computers	Industrial	Development of archival and refinement of PAT tag
Lotek	Industrial	Refinement of archival tag

TOPIC D. “COMMONS” FOR OCEAN INFORMATION

Digital Archival of Marine Mammal/Bird/Turtle Data for OBIS

Lead PI: Dr. Andrew Read, Duke University

As part of the Ocean Biogeographic Information System (OBIS), this project will create a digital database of marine mammal, seabird, and sea turtle distribution and abundance, and develop a web-based system to allow the interactive display, query, and analysis of this database in conjunction with environmental data. The intended audience includes educators, students and researchers. The project will create data summaries including species range maps and descriptions available through an interactive outreach component. Additionally, the web-based data query tools and explicit documentation of survey methods will enhance the potential for research applications of this database. These products will augment our understanding of the distribution and ecology of marine mammal, bird and turtle populations by: (1) facilitating study of potential impacts on threatened species; (2) enhancing our ability to test hypothesis about biogeographic and biodiversity models; and (3) supporting modeling efforts to predict distributional changes in response to environmental change.

Number of Years: 3

Total Proposed Budget: \$2,338,029

Table of Partners:

Partner	Sector	Roles and Tasks
Duke University	Educational	Project coordinator
Systems Science Applications	Industrial	Provide software and technical support
University of California San Diego	Educational	Interface with OBIS infrastructure project and integrate project with SeamountsOnline project
Cascadia Research Collective	NGO	Compile pertinent marine mammal abundance and photo-identification datasets and help to design criteria for data summary and display
Clymene Enterprises	Industrial	Assemble profiles for marine mammal species
E.S.R.I.	Industry	Provide software and technical support
College of the Atlantic	Educational	Compile abundance and photo-identification datasets and design criteria for data summary and display
St. Andrews University	Educational	Compile abundance datasets and supporting survey meta-data and check datasets for inclusion in public web-based system
NOAA-NMFS Southeast Fisheries Science Center	Governmental	Compile abundance datasets and supporting survey meta-data

TOPIC E. OUTREACH AND EDUCATION

Enhancing K-12 Science Education via Satellite-televised Interactive Technologies

Lead PI: Dr. Paula G. Coble

This project will transition Project Oceanography, a successful marine science education program for middle school students with a national and international audience, into a televised educational series supported by sponsors from the private sector. Program reruns will be televised during this transition year to maintain existing network of users. Additional instructional TV stations and school districts will be contacted to expand participation and increase the number of registered sites. Advertising and marketing plan will be developed to assist in expanded use of existing and future Project Oceanography programs. In collaboration with partners, a demonstration video will be produced and broadcast on hydrothermal vent science. This demo video will be promoted in conjunction with release of an IMAX movie on the same topic and will be used to solicit sponsorship of future Project Oceanography programming, thereby completing transition from a NOPP-funded project to the private sector.

Number of Years: 1

Total Proposed Budget: \$107,000

Table of Partners:

Partner	Sector	Roles and Tasks
University of South Florida	Educational	Project coordinator, promotion and distributin of products, science and education quality, and marketing
FutureVision	Industrial	Producer of demonstration video
Low Distribution Inc.	Industrial	Provide access to video and educational products and promote program worldwide

RENEWAL OF EXISTING NOPP PROJECTS

Incorporation of Sensors into Autonomous Gliders for 4-D Measurement of Bio-optical and Chemical Parameters

Lead PI: Dr. Charles C. Erickson

Oceanographers would like a detailed, 4-D view of the ocean. Moorings and ships cannot provide it. Conventional autonomous underwater vehicles might, but are too expensive and too limited in duration and range. Under a NOPP grant, this project has developed and deployed Seaglider, a small (1.8 m, 52 kg) underwater glider that moves horizontally and vertically using buoyancy and wings. It can perform several hundred dive cycles to 1000 m depth per mission, report data in real time via Iridium satellite telemetry, and accept control commands from shore. Current NOPP funding has enabled the development and expansion of Seaglider's capabilities to measure dissolved oxygen, chlorophyll fluorescence, and optical backscatter at two wavelengths in addition to physical parameters. The partnership seeks to extend Seaglider's capabilities by building on the newly developed NOPP sensors to provide measurement capability for additional optical properties; augmenting the interpretation of the optical signals; extending Seaglider's range by as much as 75%; and demonstrating the capability of a squadron of Seagliders in an offshore environment. With its newly enhanced sensors and extended range, the glider will allow the scientific community to address: separation of local from advective processes; the interaction of small-scale physics and biology; and ground truthing of satellite observations of ocean color and extending its interpretation beyond the surface. The new sensors themselves will be of great interest to scientists, environmental monitors, and the like. The glider system has obvious uses, from oceanographic research (estuarine, coastal, oceanic) and observatories to clandestine operations.

Number of Years: 2

Total Proposed Budget: \$800,000

Table of Partners:

Partners	Sector	Roles and Tasks
University of Washington	Educational	Project management, sensor validation, data analysis, modification, testing, and deployment of gliders
University of Maine	Educational	Project management, optical sensor validation, science demonstrations
WETLabs	Industrial	Develop optical sensors
Washington Department of Ecology	Governmental	Oxygen sensor validation and primary productivity

The BRIDGE

Lead PI: Dr. Lee Larkin

The BRIDGE is a novel, web-based resource center and clearinghouse that brings together marine educators, academia, the private sector, and government in support of quality ocean education. The BRIDGE provides educators with a comprehensive source of accurate and useful information on global, national, and regional marine science topics, and provides researchers with a contact point for their educational efforts. Key project elements include: joint NMEA, Sea Grant and COSEE/CCO management; national coverage and dissemination; scientific merit of included information assured by scientific advisors and close linkages to the research community; active involvement of science education community; emphasis on accurate, current, quality information and materials; improved educators' access to current data and information; improved opportunity and impact for ocean researchers' educational outreach; e-mail discussion group for marine educators and scientists; easy to use, navigate, and search; broad-based, long term partnership among project partners, oceanographic researchers, and educators.

Number of Years: 1

Total Proposed Budget: \$99,000

Table of Partners:

Partner	Sector	Roles and Tasks
Virginia Sea Grant	Governmental/Educational	Website development and maintenance
Virginia Institute of Marine Science	Educational	Website development and maintenance
National Marine Educators Association	Educational/NGO	Dissemination and implementation
COSEE Central Coordinating Office/Consortium for Oceanographic Research and Education	Governmental/NGO	National coordination
NOAA/National Sea Grant Office	Governmental	National networking

A Proposal to Assess and Expand the COOL Classroom: A Web Site to Bring Real-time data from the Long-term Ecosystem Observatory (LEO) to 6-12 Grade Classrooms

Lead PI: Michael P. DeLuca

With past NOPP support, a series of web-based, hands-on lesson plans were developed by an interdisciplinary team of scientists and K-12 educators. Lesson plans or educational modules were designed to capitalize on the cutting edge technology and real-time data streams available from the Long-term Ecosystem Observatory (LEO-15) operated by Rutgers University to develop critical thinking and analytical skills among middle and high school students. This proposal seeks continued support to address four key educational needs identified by the educators and scientists that participated in the previous NOPP effort. These are: 1) implementation of a regional scale classroom pilot of the COOL Classroom site in selected middle and high schools 2) development of an additional Internet module that capitalizes on an innovative research effort to understand the population dynamics of economically important fish species with expansion of biological sampling at the LEO-15 underwater observatory, 3) enhancements to the COOL Classroom site based on a beta pilot, and 4) continued evaluation of web-based learning by teachers and students.

Number of Years: 1

Total Proposed Budget: \$100,000

Table of Partners:

Partner	Sector	Roles and Tasks
Rutgers University – Marine and Coastal Sciences	Educational	Project coordination and implementation
Rutgers University – Center for Advanced Information Processing	Educational	Visualization of oceanographic data for K-12 audiences
NOAA-NERES	Governmental	Access to resources, staff, technology, data, and equipment
Stevens Institute of Technology	Educational	Development and piloting of web site materials
Cooperative Marine Education and Research Program		Salary report for webpage design and coordination
Virginia Institute of Marine Science	Educational	National dissemination via the Bridge
WordCraft Inc.	Industrial	Conduct evaluation
Tuckerton Seaport	Industrial	Serve as distribution site and networking center

Appendix 7: Calendar Year 2002 NAVY Funded University-National Oceanographic Laboratory System (UNOLS) Academic Ship Survey Schedules

<i>Ship</i>	<i>Institution</i>	<i>Dates</i>	<i>Days</i>	<i>Location</i>
SEAWARD JOHNSON	Harbor Branch Oceanographic Institution	5/10-5/24	14	East Coast
CAPE HATTERAS	Duke University	4/13-4/25	12	East Coast
LONGHORN	University of Texas	5/15-5/27	15	Gulf of Mexico
PELICAN	LUMCON	4/4-4/11 4/27-5/3	7 6	Gulf of Mexico
PELICAN	LUMCON	5/28-5/31 7/13-7/20	3 7	Gulf of Mexico
WALTON SMITH	University of Miami	5/2-5/16	15	East Coast
REVELLE	Scripps Institution of Oceanography	3/16-3/30	14	Hawaii
PT SUR	MOSS LANDING	11/5- 11/19	14	West Coast

Appendix 8. 2002 Coastal Observation Technology Systems Projects (COTS)

The Coastal Observation Technology System (COTS) project grants currently funded by NOAA, are designed to further the development of integrated coastal ocean observing systems on a regional basis. COTS focuses on creating an environment to share data and information collected by, and technology useful to, coastal observing systems. Partners will be able to share information on techniques and methods they are employing, and work to create a seamless flow of data, information, and products. Interoperability is the first overarching theme as the COTS partners strive to create a model of integrated observing systems that will serve to advance the national agenda as well address regional needs.

The COTS project consists of eight grants: All are currently Congressionally directed funds. Initially the group agreed to resolve data management as a common theme, and will work together to ensure that national data standards and protocols are followed. The NOAA Coastal Services Center serves as the lead federal coordinating partner and provides a Web site for communication amongst the seven separate projects. The partners will share information on techniques and methods they are employing, and work to create a seamless flow of data, information, and products. A bulletin board, data portal, and metadata node are all being established via COTS Web site. The COTS project may also serve as a model for data management in the IOOS effort. Discussion with IOOS Data and Communications Sub-Committee (DACSC) members indicates a willingness to develop a plan to make this happen. The overall effort includes facilitating communication, reporting, and workshops as necessary. To date, two workshops have been held: 1) and organizational meeting for principal investigators in Washington, D.C.; and 2) a focused data management workshop for project scientists and information technology specialists in Charleston, SC.

Appendix 9. National Oceanographic Partnership Program Award for Excellence in Partnering

9.1 CRITERIA FOR THE EXCELLENCE IN PARTNERING AWARD

One of the stated objectives of the National Oceanographic Partnership Program (NOPP) is to identify and carry out partnerships among Federal agencies, academia, industry and other members of the ocean sciences community in the areas of data, resources, and education. The purpose of these partnerships, as specified in the National Oceanographic Partnership Act, is “to promote the national goals of assuring national security, advancing economic development, protecting quality of life and strengthening science education and communication through improved knowledge of the ocean.”

The NOPP Award for Excellence in Partnering has two purposes: 1) to recognize the successful efforts of the partners in conducting a superior project and 2) to identify to the ocean sciences community and its supporters what constitutes a successful NOPP effort. The award will be given annually* to a completed NOPP-funded project that best exemplifies the partnership objectives of NOPP and successfully addresses at least one of the national goals put forth in the National Oceanographic Partnership Act.

Award recipients are selected based on the degree of and commitment to partnering, the success of the partnership effort, and the impact of the partnership on the ocean research community. The criteria are:

- Ocean sector diversity among the partners;
- Level of effort/involvement by partners;
- Matching contributions of the partners;
- Long-term commitment of the partners beyond the NOPP-funding period;
- The success of the partnership in meeting its project objectives; and
- Impact of the effort to the ocean research community.

*Awards do not have to be made annually if it is judged that there are no suitable candidates.

9.2 2002 EXCELLENCE IN PARTNERING COASTAL MARINE DEMONSTRATION PROJECT SUMMARY AND PARTNER LIST

Coastal Marine Demonstration of Forecast Information to Mariners for the U.S. East Coast

PI: Dr. Leonard J. Walstad, Horn Point Laboratory, UMCES, 2020 Horns Point Road, Cambridge, MD 21613-0775

Partners: Dr. Frank Aikman III, NOAA, National Ocean Service
Dr. Laurence C. Breaker, NOAA, National Weather Service
Mr. Glenn Szilagyi, Litton-TASC
Mr. Joseph S. D'Aleo, Weather Services International
Dr. George L. Mellor, Princeton University
Dr. Isaac Ginis, University of Rhode Island

The Coastal Marine Demonstration Project (CMDP) was a two-year partnership effort, funded by the National Oceanographic Partnership Program, which developed, improved, delivered and evaluated experimental marine forecast products for mariners of the Chesapeake Bay and surrounding coastal ocean. The partnership was a collaboration of academic, private industry, government and private citizens.

The CMDP provided high-resolution model information, down to 800 meters, which was not otherwise available to users and forecasters. The high-resolution forecast fields were based upon models with appropriate regional resolution that are capable of reproducing the atmospheric, oceanic, and estuarine circulation seen in the coastal environment. Important forecast fields were surface winds, waves, water level, currents, water temperature, salinity, visibility and ship ice accretion.

A R&D component focused on data assimilation techniques for oceanographic forecast models. The operational component was manifest through two real-time demonstrations, each of about 2 months duration, which were carried out during the summer of 1999 and winter/early spring of 2000. Six state-of-the-art forecast models were run in an operational mode to generate the forecast products and a system was implemented to deliver the forecasts to users. Model output was provided to four National Weather Service (NWS) forecast offices/centers and nearly 5000 graphics of model output and observational data were generated daily and provided to dozens of diverse customers through a user-friendly web site interface.

To assess the value of the analyses and forecast products, we developed a network of user-partners including pilots, commercial ship operators and naval officers. Several users successfully made use of a CMDP-implemented, mobile system based on cellular wireless technology. During the demonstrations, an experimental National Ocean Service (NOS) estuarine forecast center was established to monitor execution of Bay models and provide a daily interpretation of model forecasts to users. Most users assessed the products for their quality and utility via a web-based evaluation tool.

Two of the experimental models demonstrated in the CMDP are now operational, including NOS' Chesapeake Bay Operational Forecast System and NWS' Regional Ocean Forecast System.

Appendix 10. Standards, Establishment, and Administration of the Integrated Ocean Observing System (IOOS)

BACKGROUND

The House Armed Services Committee report 107-436 requested a plan be included in the NORLC's Annual Report to Congress "detailing the standards and plans for the establishment and administration of an integrated ocean and coastal observation system."

Those standards and plans are being developed by Ocean.US, the interagency office established under NOPP to oversee and coordinate the development of such a system. This appendix outlines the anticipated results of that development, pending approval by the various regional associations that constitute the federation of ocean observing systems, and by the federal agencies that constitute the NORLC. Unanticipated obstacles have resulted from the delays in FY03 funding to most of those agencies including, for example, assignment of personnel, funding of consensus workshops, and operations of the Ocean.US office.

In addition, the Ocean Commission expects to report out later this year on many of the same standards/establishment/administration aspects of an IOOS, so Ocean.US and its non-federal partners are purposefully delaying the Implementation Plan for IOOS to allow for potential consistency with the Ocean Commissions recommendations.

Nevertheless, the Implementation Plan for IOOS will begin its approval process within the agencies and regional observing associations by Summer 2003. The material below is consistent with key elements of the draft of the Plan, so may change in detail but likely not in substance.

OVERVIEW

The concept of the IOOS is of a federation of regional associations operating with great autonomy within each region, but collaborating between the regions according to rules promulgated by Ocean.US and endorsed by the regional associations.

The number of regions is approximately 10, comprising Hawaii, Alaska, Northern/Central/Southern West Coast, Gulf Coast, Southern/Central/Northern East Coast, and the Great Lakes. Not all of these regions have formed regional associations yet, so the federation is incomplete at this time.

The implementation of the IOOS requires two related components, one for the global ocean and one for U.S. coastal waters. The global component is the U.S. contribution to the international Global Ocean Observing System which is part of the Integrated Global Observing Strategy. The internationally coordinated focus is climate prediction and national security issues. The coastal component is aimed mainly at resource conservation and management, hazardous weather forecast and mitigation, commerce, and homeland security issues. Both components are essential to the goals of our nation.

Federal interests dictate a major funding and operational responsibility for the global ocean component, and for a sparse national observing system within the Exclusive Economic Zone of the United States. More detailed coastal observations and information products within each region will ultimately be the responsibility of the regions themselves, although federal input is not excluded.

Aspects of the required observational systems, data management systems, and applications and products already exist. Hence, plans for standards, establishment of expanded networks, and administration of the integrated system must blend with selected existing systems. In addition, the existing systems are a combination of sustained operational efforts (for example, the U.S. tide gauge network), operational efforts with no guarantee of being sustained (for example, remote sensing of ocean color), and research systems run by professors and graduate students for limited time periods. Integrating and sustaining the nation's observing systems is a fundamental task.

STANDARDS

At a macro level, all the necessary standards for ocean observing already exist. Each person measuring temperature, for example, uses instruments that are – or could be -- traceable to National Institute of Standards and Technology (NIST) fundamental standards. What is lacking, however, are the agreements to:

- Observing Protocols
- How often and where should something be measured, and how quickly must it be made available?
- Metadata
- What ancillary data must be maintained (e.g., instrument serial numbers)?
- Data Communications
- How is data to be moved around, using what circuits and protocols?
- Storage and Display
- Is everything stored in an archive (Where? Or is it distributed?), or are only distillations like averages stored?
- Are each of the regions using common display and access formats and protocols?
- Intellectual Property Rights
- Is all data available to everyone, or are there proprietary rights of any kind?

These must all be worked out for each parameter being sensed, which number approximately 15 in the bare-bones system and 50 or more in the comprehensive system that meets the full range of national needs.

The process to set these standards has six steps:

1. Community consensus meeting to determine the common national, and the distinct regional, sets of intended parameters and products.
2. Working groups to recommend standards to Ocean.US.
3. Ocean.US issues “notice of proposed rule-making” for community consideration.
4. Ocean.US issues “Agreed Protocols and Standards for Ocean.US” based on consideration of input received.
5. Annual community meeting to reaffirm existing standards or suggest modifications and additions.
6. Ocean.US issues annual update to its Standards document.

At this point, Step 1 is completed (Spring 2002) and Step 2 is underway. However, Step 2 cannot be completed until all the Regional Associations have met and made input to the national set of parameters and products, and outlined their regional differences. Summer 2003 is the target for completion of Step 2,

with Step 4 planned for the end of 2003. A Data Management and Communications steering committee has been established and will have a principal role in the development of these standards.

It is expected that the first Ocean.US Standards document will be incomplete, but will be filled in as experience is gained with the national system and the Regional Associations.

ESTABLISHMENT AND ADMINISTRATION OF THE IOOS

Ocean and coastal observing systems are in place for most of the 15 basic parameters and some of the comprehensive 50 parameters, in many places in the US EEZ and in the global ocean. These observations, and their associated data management and product generation are, however, not integrated, the funding is not stable, and there are massive gaps and uncertainties in both the data sets and the set of products that are available.

This suggests that a primary initial objective in the Implementation Plan is to work toward selective integration of what we already have, working across and among the agencies, and with the private sector and academia. If existing systems cannot be integrated, there is nothing to stand on for the expansion of the IOOS into higher resolution, more accuracy, and added parameters.

Thus, although elements of an IOOS already exist, establishing the initial IOOS will require an interagency effort through Ocean.US to selectively integrate the extant observing and systems and formulate mechanisms for product development and dissemination that meet the needs of the nation. This is the initial phase of IOOS.

Establishing the Initial IOOS

The administration of this first step is different than the administration of subsequent steps in the development of the fully integrated, multi-disciplinary observing system in which entirely new and greatly expanded sensor networks, data systems, and products are the focus. Existing elements of the IOOS are embedded in nearly all the NOPP agencies, plus others. They will surely continue in their present homes. The integration effort is therefore focused on the task of data systems that can get access to existing archives and bring disparate information together to enhance existing products and provide a few new ones.

The administration of a data-system integration of the initial IOOS is best done by an interagency task-force dedicated to exactly that effort, aimed at an improved ability for each of the participating agencies to achieve its own mission, by getting more data and information than it had before, at the minor cost of working together as partners.

In this initial integration phase of the IOOS, the metric is whether the individual agencies can individually achieve more than they could have in the absence of an integrated, multi-agency system. They realize this metric by working together to provide to each other what they already have. This requires an Ocean.US effort to coordinate the selective incorporation of existing elements and to ensure the establishment of common data systems and standards.

The administration of the selective integration of existing elements is by an interagency task force that reports to the NORLC through Ocean.US.

The Enhancement Phase

In parallel with the interagency effort to integrate existing elements to establish the initial IOOS, individual agencies are developing budget initiatives to enhance and expand the initial system. An

example is the NOAA/NWS/NDBC network of moored buoys for surface meteorology and wave information; more such buoys are needed, and each of them needs to measure more parameters (especially in the near coastal locations). Although the prime near-term effort is to integrate the extant buoy network with other ocean measuring tools through the development of an integrated data management system, the enhancement phase of IOOS will aim at an improved buoy network.

As the initial IOOS becomes established (3-5 years), the enhancement phase will increasingly absorb the attention and new funding. It is critical in the enhancement phase to have a well-conceived plan for what should be done first, what is affordable, and what must wait to be implemented. For example, certain ocean chemical sensors are still very much in the research domain and not ready for widespread deployment; they will need to wait for technology development and improved engineering.

The administration of the enhancement phase of IOOS requires a mechanism to allow some agencies to step out in front, and to ask others to hold back. The total dollars available for IOOS need to be invested in the right things at the right times. The administration for this phase requires top-down guidance and concurrence to options prepared under Ocean.US coordination. It is anticipated that the NORLC will take a stronger role in deciding the sequence of activities during the enhancement phase.

A model for the enhancement phase is the mission-launch list at NASA. Getting on the list is competitive; moving up the list requires the right combination of technological readiness, opportunity, and affordability. In a similar way, the NOPP agencies will have their individual thoughts on what enhancements are needed to the IOOS, and who should do or fund them, but an NORLC guided, Ocean.US staffed, process is required to keep the costs of IOOS within bounds and the progress rational.

The administration of the enhancement phase of IOOS is by the NORLC, staffed by Ocean.US, with OSTP oversight. The implementation is by NORLC preparation of an annual update to a five-year plan for IOOS enhancements. This will start in FY05, with FY07-09 being the main growth years, and FY10 being the end of the phase.

The Sustained Phase

IOOS must be sustained. There is a daily need for coastal ocean information that will not go away, and a long-term need to monitor changing conditions for the detection and attribution of climate change. In the sustained phase of IOOS, many of the initial elements of the IOOS will still be operating, the enhanced systems will be in place, and technology and understanding of the ocean will still be improving. There will be a continuing effort to decide if something new is needed, if something old is no longer needed, if there are “better, cheaper, faster” ways to do things, and if the quality of the outputs is being maintained. New products based on existing data will continue to be developed, and new objectives will arise.

The major need during the sustained phase of IOOS is to keep things working, juggle the costs of maintenance versus improvements, and stay focused on the objectives set by the customer-user groups. Historically, operational, long-term systems have either not been robust (because there was insufficient attention to maintenance and house-keeping), or have not been up-to-date (because of too much attention on just keeping things working). The challenge of the sustained phase of IOOS then is to balance the input of new technology, methodology, and products, with maintaining a robust system with guaranteed outputs.

The appropriate administration of the sustained phase is one with checks-and-balances, to ensure the pendulum doesn't get too far toward or too far away from both robustness and continual improvement. This is best done with user groups that express the needs of the customers of IOOS, that identify technologies and modern methodologies to be incorporated, and represent those groups that do the day-to-day work in the ocean, at the data centers, and in the product-development groups.

Periodically, these groups will make their case to Ocean.US, which will prepare options and recommendations for NORLC decisions. Money and other resources will constrain what happens; not everything will be reasonable or affordable. The results of the NORLC decisions will affect the annual updates to the IOOS five-year plan.

SUMMARY

IOOS inevitably has three phases (establishing the initial system, enhancing it, and sustaining it) which are not distinct and which represent only the main focus during various time periods. The initial elements of the IOOS will be around a long time; some of them will need to be sustained; enhancements will always be needed, proposed, and implemented.

Nevertheless, the main focus during these three phases requires differing administration of the IOOS. The one recurring thread, however, is that IOOS is an interagency effort, so Ocean.US is always in the middle, as the executive office for the NORLC to implement and manage an IOOS.

Acronyms and Abbreviations

ADEOS-II	Advanced Earth Observing Satellite II
AGU	American Geophysical Union
AMSR	Advanced Microwave Scanning Radiometer/
AOML	Atlantic Oceanographic and Meteorological Laboratory
ARRV	Alaska Region Research Vessel
ASCAT	Advanced Scatterometer
ASLO	American Society of Limnology and Oceanography
AUV	Autonomous Underwater Vehicle
AVHRR	Advanced Very High Resolution Radar
BAA	Broad Agency Announcement
BATS	Bermuda Area Time Series
CMDP	Coastal Marine Demonstration Project
CoML	Census of Marine Life
CORE	Consortium for Oceanographic Research and Education
COSEE	Centers for Ocean Science Excellence in Education
COTS	Coastal Observatory Technology Systems
DACSC	Data and Communications Sub-Committee
DARPA	Defense Advances Research Projects Agency
DHS	Department of Homeland Security
DOC	Department of Commerce
DoE	Department on Energy
DoS	Department of State
EEZ	Economic Exclusion Zone
EPA	Environmental Protection Agency
ESP	Environmental Sample Processor
EXCOM	Ocean.US Executive Committee
FOFC	Federal Oceanographic Facilities Committee
GBIF	Global Biodiversity Information Facility
GODAE	Global Ocean Data Assimilation Experiment
GoMOOS	Gulf of Maine Ocean Observing System
GOOS	Global Ocean Observing System
HBCU	Historically Black Colleges and Universities
HIS	Hispanic Serving Institutions
HOTS	Hawaiian Ocean Time Series
IOOS	Integrated Ocean Observing System
IWG	Interagency Working Group
JHC	Joint Hydrographic Center
LBT	L-Band Transceiver
LEO	Long-term Ecosystem Observatory
METOP	Meteorological Operational

MMS	Minerals Management Service
MOSEAN	Multi-disciplinary Ocean Sensors for Environmental Analyses and Networks
MPC	Marine Prediction Center
MREFC	Major Research Equipment and Facilities Construction
MSI	Minority Serving Institutions
NASA	National Aeronautics and Space Administration
NDBC	National Data Buoy Center
NESDIS	National Environmental Satellite, Data, and Information Service
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NOPP	National Oceanographic Partnership Program
NOPPO	National Oceanographic Partnership Program Office
NORLC	National Ocean Research Leadership Council
NOSB	National Ocean Sciences Bowl
NPOESS	National Polar-orbiting Operational Environmental Satellite
NSF	National Science Foundation
NWS	National Weather Service
OBIS	Ocean Biogeographic Information System
OMB	Office of Management and Budget
ONR	Office of Naval Research
ORAP	Ocean Research Advisory Panel
ORSMP	Ocean Research Synthesis and Modeling Program
OSTP	Office of Science and Technology Policy
PI	Principal Investigator
PMEL	Pacific Marine Environmental Laboratory
POES	Polar-orbiting Operational Environmental Satellite
RFP	Request for Proposals
SBIR	Small Business Innovative Research
SEA-COOS	South East Coastal Ocean Observing System
SST	Sea Surface Temperature
SVW	Surface Vector Winds
TCU	Tribal Colleges and Universities
TMI/TRMM	TRMM Microwave Imager/Tropical Rainfall Measuring Mission
TOPP	Tagging of Pacific Pelagics
TOS	The Oceanography Society
UNOLS	University-National Oceanographic Laboratory System
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USGS	United States Geological Survey
VIIRS	Visible Infrared Imager Radiometer Suite
VNIS	Virtual Network Information System
VODHub	Virtual Ocean Data Hub